

REVIEW OF THE GENUS *OLDENLANDIA* L. (RUBIACEAE) AND RELATED GENERA IN AUSTRALIA

David. A. Halford

Queensland Herbarium, Meiers Road, Indooroopilly, Qld 4068, Australia

Summary

Australian Rubiaceae previously referred to *Oldenlandia* and/or *Hedyotis* and *Synaptantha* are referred to *Oldenlandia*, *Synaptantha*, *Kohautia* and *Hedyotis*. Keys to recognized genera and species are given. Twenty species of *Oldenlandia*, two species of *Synaptantha* and four species of *Hedyotis* are recorded for Australia. Two new species, *Oldenlandia kochiae* and *O. spathulata*, one new subspecies, *O. mitrasacmoides* subsp. *nigricans*, and one new variety, *Synaptantha tillaeacea* var. *hispidula* are diagnosed and described. *Oldenlandia leptocaulis*, *O. laceyi*, *O. largiflorens*, *O. thysanota*, *O. delicata*, *O. argillacea*, *O. mitrasacmoides* subsp. *trachymenoides* and *Synaptantha scleranthoides* are new combinations based on *Hedyotis leptocaulis* Halford, *H. laceyi* Halford, *H. largiflorens* Halford, *H. thysanota* Halford, *H. delicata* Halford, *H. argillacea* Halford, *H. trachymenoides* F. Muell. and *H. scleranthoides* F. Muell. respectively. Lectotypes are designated for *Hedyotis galioides*, *H. polyclada*, *H. coerulescens*, *H. mitrasacmoides*, *H. trachymenoides* and *Synaptantha tillaeacea*.

Introduction

Oldenlandia L., in the Rubiaceae tribe Hedyotideae Cham. & Schlecht., occurs throughout the tropical and warm subtropical regions of the world, with its largest diversity in Africa. Estimates of 100 (Verdcourt 1976) to 300 (Mabberley 1989) species have been made for the genus worldwide, with the lower estimate probably closer to the actual number recognizable.

There has been confusion over the delimitation of *Oldenlandia* L. and *Hedyotis* L. ever since they were described by Linnaeus in his 'Species Plantarum' (1753). Linnaeus included four species in *Oldenlandia*, namely *O. uniflora*, *O. umbellata*, *O. biflora* and *O. corymbosa*, and its name was later lectotypified by Hitchcock (1929) by *O. corymbosa*. *Hedyotis* included three species, namely *H. auricularia*, *H. fruticosa* and *H. herbacea*, and its name was later lectotypified by Chamisso and Schlechtendal (1829) by *H. auricularia*. Although *H. auricularia* is one of the species Linnaeus listed under *Hedyotis* in his first edition of 'Species Plantarum', Bremekamp (1939, 1952) queried the selection of the type of *H. auricularia* as lectotype because Linnaeus described the fruit of *Hedyotis* as dehiscent and the fruits of this species are indehiscent. Bremekamp proposed the replacement of *H. auricularia* with *H. fruticosa* as type as the latter is the only species described by Linnaeus fitting the generic description of *Hedyotis* in his 'Genera Plantarum' (1754). Bullock (1958) agreed with this decision. This relectotypification of *Hedyotis* was not accepted by Fosberg (1943), Rogers (1987) or Smith and Darwin (1988). However Fosberg and Sachet (1991) have more recently accepted Bremekamp's relectotypification. Although this matter cannot be considered resolved I will accept Bremekamp's choice of *H. fruticosa*.

The early taxonomic literature regarding these closely related genera has been reviewed by Fosberg (1943), Bremekamp (1952) and Rogers (1987).

Australian History

The treatment of *Oldenlandia* and related genera has varied considerably in the various floras of Australia as it has in other parts of the world. The first record of *Hedyotis* in Australia was in Mueller's Fragmenta (1863) where he described seven new species. Bentham (1866) listed nine species of *Hedyotis* for Australia. One of these, *H. auricularia*, was described from Indian material, another was described as a new species, *H. elatinoides*, based on a specimen of Drummond's from Western Australia, while the rest were the species from Mueller's earlier work. Bentham commented that he had initially considered that there were sufficient characters to distinguish *Oldenlandia* from *Hedyotis*. However, he considered the Australian species to be somewhat intermediate between these two genera and followed Torrey and Gray (1841) and Wight and Arnott (1834) in accepting the broader concept of *Hedyotis*.

The species previously treated by Bentham under the name *Hedyotis* were referred by Hooker (1873) to *Synaptantha*, *Oldenlandia*, *Hedyotis* or *Anotis* although none of the necessary new combinations were formally made for them. *Synaptantha* was circumscribed as a new genus to include *H. tillaeacea* F. Muell. He distinguished it by its 3/4 superior capsule and its marcescent rotate corolla together with the persistent staminal filaments. He retained *H. auricularia* under *Hedyotis* and placed *H. galioides* F. Muell. and *H. scleranthoides* F. Muell. under *Oldenlandia*. Those Australian species with dorsiventrally flattened seeds (*H. trachymenoides* F. Muell., *H. mitrasacmoides* F. Muell. and *H. pterospora* F. Muell.) were placed in the genus *Anotis*.

Mueller (1874, 1876) described another three new species of *Hedyotis* for Australia. Later Mueller (1882) transferred all Australian species of *Hedyotis* to *Oldenlandia*, probably believing this to be the correct name for the aggregate genus. Bailey (1900) recognized *Synaptantha*, *Oldenlandia* and *Hedyotis* for Queensland though the characters he used to distinguish between *Oldenlandia* and *Hedyotis* are not clear. More recently, Schwarz (1927) described two new species of *Oldenlandia*, *O. tenuissima* and *O. molugoides*, from the Northern Territory. Domin (1929) followed Hooker (1873) and made two new combinations in *Anotis*, and incorrectly attributed others in *Anotis* to Hooker (1873). Recent regional floras (Marsden 1981; Stanley & Ross 1986) have recognized the monotypic genus *Synaptantha* and *Hedyotis* in the broad sense.

Generic delimitation

There have been a number of regional studies outside Australia which have examined the relationship of *Oldenlandia*, *Hedyotis* and closely related genera within their regions. Unfortunately there has been disagreement about the resultant generic delimitations. Fosberg (1943) and Fosberg and Sachet (1991) considering the Micronesian and Polynesian taxa, and Lewis (1961, 1962) considering the North American taxa, adopted a broad concept of *Hedyotis* merging several closely related genera, including *Oldenlandia*, with it. They concluded that characteristics of the seed, flower and fruit that had been traditionally used to delimit the genera were inconsistent within taxa and of minor diagnostic significance. They maintained *Oldenlandia* as a subgenus of *Hedyotis*. More recent work on North American taxa by Terrell (1975, 1990, 1991) and Terrell and Lewis (1990) concluded that there were fundamental differences in habit and morphology of inflorescence, flower, capsule and seed together with cytological evidence that supports maintaining the genera as distinct.

In his revision of the African species of *Oldenlandia*, Bremekamp (1952) took a narrow view of the genus, maintaining *Oldenlandia* as separate from *Hedyotis* and describing a number of smaller genera. He considered the genus *Hedyotis* to be a distinct Asian taxon based on *H. fruticosa*. Lewis (1965) and Verdcourt (1976) considered some of Bremekamp's segregate genera not worthy of recognition and adopted a more conservative treatment of the tribe Hedyotideae while retaining a number of the palynologically and morphologically distinct genera including *Oldenlandia* and *Hedyotis*.

Recently Maheswari Devi and Krishnam Raju (1990) reported on the embryological features of eight species from four sections of *Hedyotis* as treated by Wight and Arnott (1834). Within their concept of the genus *Hedyotis*, Wight and Arnott (1834) combine a number of closely related genera including *Oldenlandia*. Maheswari Devi and Krishnam Raju concluded that the broad generic concept of Wight and Arnott was not supported by their data. They considered that section *Diplophragma*, which includes *H. fruticosa*, the type of *Hedyotis*, should be retained as distinct genus from the other sections of *Hedyotis sensu* Wight and Arnott.

As pointed out by a number of workers (e.g. Verdcourt 1976; Terrell 1975), the genus *Hedyotis*, when treated in the broad sense, is very polymorphic and cumbersome. I believe there is sufficient morphological and embryological evidence to indicate that the merging of these closely allied taxa into one very large genus is not warranted. It is more desirable, especially in reference to the Australian material, to recognize a number of narrowly circumscribed genera most of which are well defined and easily recognizable. However, applying the generic limits used for *Oldenlandia* in African and American accounts (Bremekamp 1952; Terrell 1990) to the Australian material would require at least two additional genera to be established to accommodate the variation in the

presently-known species. I believe it is premature to describe new genera before a more complete assessment of relationships of the Australian taxa to the Asian taxa is made. In this treatment I have taken a broader view of the genus *Oldenlandia* than that used by Bremekamp (1952) and Terrell (1990). But even so, the Australian species previously included in the genus *Hedyotis* are still separable into four genera namely *Oldenlandia* L., *Synaptantha* J.D. Hook., *Exallage* Bremek. and *Kohautia* Cham. and Schlecht.

The genera of Hedyotideae in Australia may be distinguished using the following key.

1. Fruit cartilaginous splitting septicidally into 2 indehiscent cocci
or indehiscent **Hedyotis**
Fruit thin walled, crustaceous, loculicidally dehiscent, sometimes splitting
septicidally but only above persistent calyx lobes and never into two
indehiscent cocci 2
2. Flowers 5-merous; fruit mitriform; flowers in terminal compact corymbiform
cymes **Ophiorrhiza**
Flowers 4-merous; fruit not mitriform; flowers in terminal or axillary, lax,
paniculiform or corymbiform cymes, sometimes in fascicles or solitary
at nodes 3
3. Corolla tube less than 0.3 mm long; corolla often persistent on fruit; fruit
1/2 to 2/3 superior **Synaptantha**
Corolla tube more than 0.5 mm long; corolla not persistent on fruit; fruit
no more than half superior 4
4. Corolla tube cylindrical with two distinct widths; anthers and stigma
included, the latter always overtopped by anthers; anthers inserted in
top of tube; flowers isostylous **Kohautia**
Corolla tube cylindrical with only one distinct width or funnel-shaped;
anthers and/or stigma exserted or if both included then anthers over-
topped by the stigma; flowers isostylous, heterostylous or
protandrous **Oldenlandia**

The genera *Kohautia* and *Ophiorrhiza* have been treated by Halford (1991a & 1991b respectively).

Materials and Methods

Descriptions have been prepared from dried herbarium specimens or material preserved in a 70% alcohol, glycerol and water mixture. Herbarium holdings of Australian material at AD, BRI, CANB, DNA, K (collected prior to 1927), MEL, NSW, PERTH and QRS have been examined. Selected material of non-Australian taxa from Africa, India and Malesia from K and L was also examined. All taxa dealt with here except for *O. crouchiana*, *O. polyclada*, *O. pterospora*, *O. tenelliflora* var. *papuana* and *Hedyotis novoguineensis* have also been observed in the field. The conservation status of each taxon has been coded using the criteria of Briggs and Leigh (1988). All material cited has been seen unless otherwise stated.

Terms used to describe the various parts of flowers, fruit or seed are here defined.

Beak: That portion of the capsule above the insertion of the persistent calyx lobes.

Calyx-tube: Refers to that part of the calyx fused to the ovary.

Geniculate corolla lobes: At anthesis the corolla lobes are erect in the lower part spreading perpendicularly only some distance from the base of the lobes. At the knee (the bend) there is a transverse line of dense short soft hairs.

Obloid: Three dimensional shape; a parallelepiped (i.e. brickshape) with rounded corners and edges. (Marchant *et al.* 1987)

Oldenlandia

Oldenlandia L., Sp. pl. 1: 119 (1753), Gen. pl., ed. 5, 55 (1754). **Type:** *Oldenlandia corymbosa* L.

Hedyotis L. sensu Benth., Fl. Austral. 3: 403–406 (1866), in part.

Annual herbs or rarely herbaceous perennials; stems erect, procumbent or rarely prostrate. Leaves opposite, entire, sessile or shortly petiolate. Stipules interpetiolar, adnate to leaf-bases, membranous, mostly produced into triangular lobes; margins usually fimbriate. Flowers in terminal or axillary, lax, paniculiform or corymbiform cymes, sometimes in fascicles or solitary at node. Flowers small, 4-merous, protandrous, isostylous (or heterostylous – not in Australia). Calyx-tube turbinate, globose or obloid, rarely ribbed; lobes distinct, sometimes joined at base into a short free tube. Corolla white, pale mauve, blue or pink, hypocrateriform or narrowly infundibular; lobes valvate. Stamens with filaments attached on corolla tube at or below sinus between corolla lobes. Anthers dorsifixed. Ovary 2 locular, 4/5 to 9/10 inferior; ovules 2 to numerous on fleshy, globose or obloid placentas. Placenta peltately attached centrally or near base of septum by short stalk. Style terete or filiform; stigma mostly bifid, sometimes capitate, rarely conical. Capsule crustaceous, with loculicidally dehiscent beak. Seeds mostly numerous, obconic, truncate obconoidal, meniscoid, scutelliform, cerebriform or obovoid, sometimes becoming mucilaginous when moistened; surface variously patterned.

Distribution: In Australia the genus occurs predominantly north of the Tropic of Capricorn, with several species extending down the east coast to the Moreton District, Queensland, and two species occurring in the southern regions of the Northern Territory. Twenty species occur in Australia; 19 species are native, of which 14 are endemic, and 1 is introduced.

No attempt has been made in this paper to place the Australian taxa of *Oldenlandia* into a infrageneric classification. However, it is possible to distinguish in them five groupings based mostly on seed morphology. The relationships between these groupings and their relationship to the infrageneric classification developed by Bremekamp (1952) for the African *Oldenlandia* have not been determined.

Group 1. *O. corymbosa*, *O. polyclada*, *O. tenuifolia*, *O. subulata*, *O. galioides*, *O. tenelliflora* and *O. kochiae*. Flowers isostylous. Seeds obconic to depressed obconic, mostly slightly laterally compressed, obdeltate to shallowly obtriangular in outline, becoming mucilaginous when moistened; hilum near centre of ventral surface; surface reticulate or reticulate-areolate. **Fig. 1A.**

Group 2. *O. mitrasacmoides* and *O. pterospora*. Flowers isostylous. Seeds meniscoid or scutelliform, oblong or broadly elliptic in outline, becoming mucilaginous when moistened; hilum situated on a conspicuous central ridge; surface reticulate-areolate or reticulate-foveate. **Fig. 1B–D.**

Group 3. *O. crouchiana*, *O. spermacocoides*, *O. spathulata* and *O. biflora*. Flowers isostylous. Seeds cerebriform or transversely ellipsoidal, transversely elliptic, depressed ovate or depressed obovate in outline; not becoming mucilaginous when moistened; hilum near centre of ventral surface on seed; surface reticulate-foveate or scrobiculate. **Fig. 1E–G.** The first three species appear to be more closely related to one another than to *O. biflora*.

Group 4. *O. leptocaulis*, *O. delicata*, *O. laceyi*, *O. thysanota* and *O. largiflorens*. Flowers protandrous. Seeds truncate obconoidal, irregular in outline, not becoming mucilaginous when moistened; hilum near centre of ventral surface in shallow depression; surface reticulate-foveate. **Fig. 1H.** A natural group quite distinct from the remainder of the Australian *Oldenlandia*. Preliminary investigations of pollen show that they have 6- to 9-colporate pollen distinct from the rest of the Australian *Oldenlandia* whose pollen is 3- or 4-colporate.

Group 5. *O. argillacea* and *O. coerulescens*. The position of these species appears somewhat uncertain. Their habit, floral and fruit morphology reveal that these two species are closely related. However, seed morphology would place them in Groups 1 and 2 respectively.

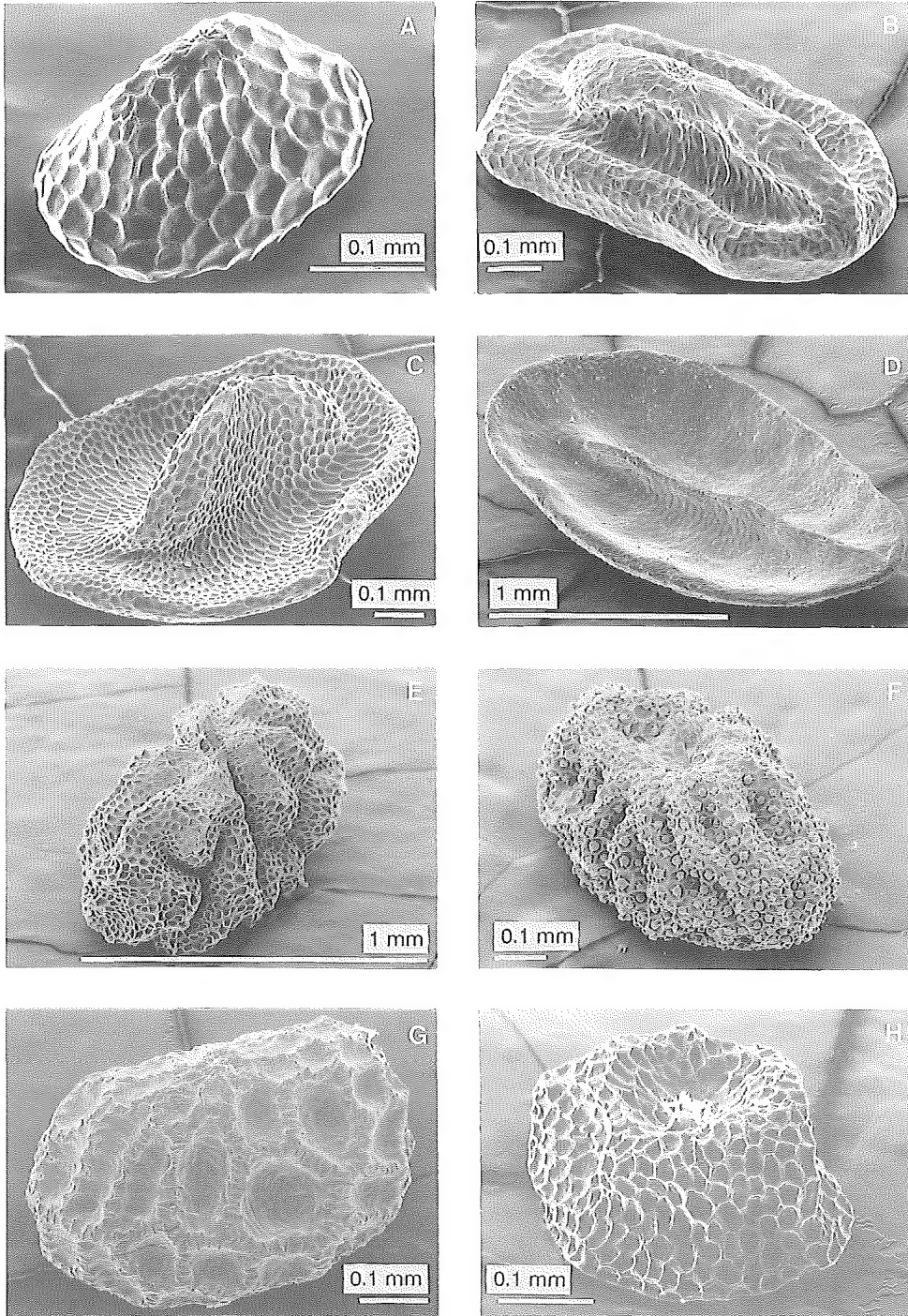


Fig. 1. Scanning electron micrographs of *Oldenlandia* seeds (oblique adaxial view). A. *O. galioides* (Halford H147). B. *O. mitrasacmoides* subsp. *mitrasacmoides* (Halford H19). C. *O. mitrasacmoides* subsp. *trachymenoides* (Halford H3). D. *O. pterospora* (Nelson 6). E. *O. spermacocoides* (Byrnes 715). F. *O. spathulata* (Halford Q466). G. *O. biflora* (Sharpe et al. 4475). H. *O. laceyi* (Halford H72).

Key to Australian species of *Oldenlandia*

1. Corolla lobes geniculate with a line of hairs at knee only 2
Corolla lobes spreading from base, straight or evenly recurved with hairs
present or absent at base of corolla lobes 6
2. Capsule subglobose or turbinate-obovoid, not markedly longer than broad 3
Capsule obloid or obloid-ellipsoidal, markedly longer than broad 4
3. Flowers in subsessile fascicles; leaves linear, narrow elliptic or oblanceolate, 15–35 mm long, 1–8 mm wide. WA, NT **12. *O. spermacocoides***
Flowers in pedunculate lax cymes; peduncles 1–3 cm long; leaves elliptic or oblong-elliptic, 15–60 mm long, 5–20 mm wide. Qld **1. *O. biflora***
4. Herbs to 20 cm tall; branchlets stout, tetragonous or tetraquetrous; corolla with tube 1.0–1.5 mm long and lobes 3.0–6.5 mm long; capsule obloid, 3.5–6.0 mm long, 3.5–4.5 mm wide; seeds cerebriform. WA **10. *O. crouchiana***
Herbs to 40 cm tall; branchlets terete or obtusely 4-angled, somewhat tetragonous when young; corolla with tube 0.5–1.0 mm long and lobes 2.0–4.5 mm long; capsule ellipsoidal or obloid-ellipsoidal, 2.5–5.0 mm long, 1.5–3.0 mm wide; seeds obconic or somewhat scutelliform 5
5. Seeds depressed obconic, shallowly obtriangular in outline; hilum near centre of ventral surface. WA, NT, Qld **8. *O. argillacea***
Seeds somewhat scutelliform, broadly elliptic in outline; hilum on longitudinal ridge on ventral surface. Qld **9. *O. coerulescens***
6. Throat of corolla tube densely bearded or with a distinct line of hairs at base of corolla lobes 7
Throat of corolla tube glabrous or tube internally hairy without distinct line of hairs at throat 11
7. Seeds scutelliform; hilum on longitudinal ridge on ventral surface 8
Seeds cerebriform, obconic or truncate obconoidal, never scutelliform; hilum near centre of ventral surface 9
8. Flowers on unequal, stout pedicels; capsule depressed obovoid, deeply furrowed along dissepiment; beak emarginate; ovules 2 to 6 per locule. WA, NT **15. *O. pterospora***
Flowers on ± equal, slender pedicels; capsule subglobose, ovoid-globose or depressed obovoid, slightly furrowed at dissepiment; beak rounded or truncate; ovules more than 10 per locule. WA, NT, Qld **14. *O. mitrasacmoides***
9. Corolla tube less than 2 mm long 10
Corolla tube longer than 3 mm. NT **19. *O. thysanota***
10. Prostrate or decumbent herbs, occasionally forming a mat; flowers axillary, either solitary or in 2- to 7-flowered umbel-like corymbs. WA, NT, Qld **2. *O. corymbosa***
Weakly ascending herbs; flowers terminal, in irregular dichasially branched cymes. WA **13. *O. kochiae***
11. Flowers in lax terminal cymes 12
Flowers axillary, either solitary or in subsessile or pedicellate fascicles 16
12. Capsule obloid-ellipsoidal, 5–10 mm long; corolla lobes spatulate, 6–8 mm long. Qld **11. *O. spathulata***
Capsule globose to subglobose, less than 4 mm diameter; corolla lobes 1–4 mm long 13

13. Decumbent herbs; branchlets rooting at nodes; flowers not protandrous; seeds obconic, laterally compressed. Qld **5. *O. subulata***
 Erect or ascending herbs; branchlets not rooting at nodes; flowers protandrous; seeds truncate obconoidal 14
14. Plants to 50 cm tall; leaves to 6 cm long; corolla tube longer than 6 mm; capsule 2–3 mm diameter. WA, NT **16. *O. largiflorens***
 Plants to 30 cm tall; leaves 1–4 cm long; corolla tube less than 5 mm long or if longer then the capsule 1.5–2.0 mm diameter 15
15. Corolla infundibuliform; staminal filaments 0.5–1.0 mm long; calyx lobes 0.5–1.5 mm long. NT **18. *O. leptocaulis***
 Corolla hypocrateriform; staminal filaments 0.2–0.5 mm long; calyx lobes 0.5–1 mm long. WA, NT, Qld **17. *O. lacey***
16. Flowers solitary in leaf axils or if more than one, with rudiments of a branchlet between them; leaf apex acute, never with mucro 17
 Flowers in subsessile axillary or terminal fascicles or if solitary then leaf apex mucronate 20
17. Indumentum on stems and leaves retrorse. WA **20. *O. delicata***
 Indumentum, if present, on stems and leaves erect or antrorse 18
18. Capsule subglobose, 2.5–3.5 mm diameter; beak broad, calyx lobes 2–3 mm long; corolla infundibular to campanulate with tube 1.5–3.5 mm long. Qld 19
 Capsule ovoid-globose, 1.5–3.0 × 1.0–3.0 mm, slightly compressed; beak narrow; calyx lobes 1.0–1.5 mm long; corolla tubular to narrow infundibular with tube 0.5–1.5 mm long. WA, NT, Qld. **3. *O. galioides***
19. Pedicels slender, 6–25 mm long, papillose. Qld **5. *O. subulata***
 Pedicels stout, 2–10 mm long, glabrous. NT, Qld **4. *O. tenuifolia***
20. Low spreading herbaceous perennial; stems much branched, becoming woody with age; flowers terminal in fascicles of 2–8 or solitary; pedicels 3–6 mm long. Qld **6. *O. polyclada***
 Procumbent annual; stems sparingly branched; flowers axillary in subsessile cymes; pedicels to 1 mm long. Qld **7. *O. tenelliflora* var. *papua***
- 1. *Oldenlandia biflora* L.** Sp. pl. 1: 119 (1753); *Hedyotis biflora* (L.) Lam., Encycl. 1: 272 (1791); *Thecagonum biflorum* (L.) Babu, Bull. Bot. Surv. India 11: 213–214 (1969). **Type:** Ceylon, *Hermann* (holo: BM, photo BRI).
Hedyotis racemosa Lam., Encycl. 3: 80 (1789). **Type:** *Sonnerat* s.n. (holo: P-LA, microfiche BRI).

Spreading prostrate to decumbent annual herbs; divaricately branched; branchlets stout, obtusely 4-angled, glabrous sometimes scabridulous along ribs. Leaves elliptic to narrow elliptic or oblong-elliptic, 15–60 mm long, 5–20 mm wide, somewhat succulent, scabridulous along margin and midvein above, glabrous below, attenuate at base, obtuse or acute at apex; petiole 1–3 mm long, sometimes scabridulous. Stipule-sheath 2–3 mm long, glabrous or sparsely pubescent, produced into triangular lobe; margin fimbriate. Inflorescences terminal or axillary, few-flowered cymes; peduncles 10–30 mm long; pedicels 5–10 mm long; bracts subulate or oblong, 1–4 mm long. Calyx-tube turbinate, somewhat angular sometimes ribbed, 1.0–1.5 mm long, 1.0–1.7 mm wide; lobes triangular, 1.0–1.5 mm long, glabrous, scabridulous on margin. Corolla white or occasionally pale blue; tube short, 0.5–0.8 mm long, not exceeding calyx lobes, glabrous; lobes linear, 2–3 mm long, geniculate at c. 1/3 of their length from tube, with a transverse line of hairs on lobes at knee. Filaments 0.2–0.5 mm long; anthers globose, 0.4–0.6 mm long. Ovules numerous in each locule. Style 0.5 mm long, glabrous; stigma simple, filiform to narrowly conical, c. 0.8 mm long. Stamens and style exserted from corolla tube but enclosed by

lobes, overtopped by ring of hairs on lobes. Capsule turbinate-obovoid, 2.5–4.5 mm long 3.0–3.5 mm wide, laterally compressed, glabrous, sometimes 4-ribbed; calyx lobes erect; beak, c. 0.5 mm long, truncate, not exceeding calyx lobes. Seeds 3 or 4 per capsule, transversely ellipsoidal, c. 0.5 mm wide; surface brown, scrobiculate. **Figs 1G & 3C, D & E.**

Selected specimens: Queensland. COOK DISTRICT: Dauan Island, Murray Group, 9°25'S, 142°32'E, Jul 1974, *Heatwole & Cameron* 800 (BRI); Murrays Island [Murray Islands], undated, *Chalmers* [MEL 115168] (MEL); Arthur Creek on the track from Batavia Downs to Meluna, c. 21 km SSW of Batavia Downs, 12°50'S, 142°36'E, Jul 1985, *Clarkson* 6089 (BRI); Endeavour River, 1770, *Banks & Solander* (BRI); New Holland [Endeavour River], 1770, *Banks & Solander* [MEL 115113] (MEL); Endeavour River, 1882, *Persietz* 287 (MEL). NORTH KENNEDY DISTRICT: Cleveland Bay, 1882, *Berthand* [MEL 115162] (MEL). SOUTH KENNEDY DISTRICT: Turtle Bay, Carlisle Island, 35 km N of Mackay, 20°47'S, 149°17'E, Sep 1986, *Sharpe & Batianoff* 4418 (BRI); Port Mackay, undated, *Dietrich* 478 (MEL). PORT CURTIS DISTRICT: Fitzroy River, undated, *Bowman* s.n. [MEL 115111] (MEL); Rockhampton, undated, *Thozet* 574 (MEL).

Distribution and habitat: *O. biflora* occurs from India through New Guinea to Samoa and north to the Marshall Islands. In Australia it is found along the eastern coast of Queensland from Cape York to Rockhampton and on offshore islands (**Map 1**). It grows in woodlands and forests which fringe streams or intertidal areas on moist or swampy soils.

Conservation status: This species is not considered rare or threatened at present.

2. *Oldenlandia corymbosa* L., Sp. pl. 1: 119 (1753); *Hedyotis corymbosa* (L.) Lam., Encycl. 1: 272 (1791). **Type:** Drawing in Plumier, Nov. Pl. Gen. t. 36. (1703), lecto *vide* Verdcourt, Fl. Trop. E. Africa, Rubiaceae 309 (1976).

Decumbent or prostrate annual herbs, divaricately branched; branchlets terete or ribbed, glabrous, smooth or scabridulous on ribs. Leaves subsessile or shortly petiolate, linear to narrowly elliptic, 10–30 mm long, 1.0–5.5 mm wide, discolorous, glabrous or sparsely covered with minute scabrous hairs above and on margin, glabrous below, attenuate at base, acute at apex. Stipule-sheath 1–2 mm long, glabrous or rarely with a few scattered minute scabrous hairs, truncate or produced into triangular lobe; margin with 2 or 3 laciniae up to 2 mm long. Inflorescences 2–7-flowered umbel-like corymbs or flowers solitary in leaf axils, both kinds present on one plant; peduncle 3–17 mm long; pedicels 1–7 mm long, both glabrous or with a few scattered minute scabrous hairs; bracts minute. Calyx-tube subglobose, c. 1 mm diameter, glabrous; lobes triangular, 1.0–1.5 mm long, keeled, scabridulous on margin and keel. Corolla white, glabrous outside; tube cylindrical, 0.5–1.0 mm long; lobes ovate, 0.5–1.5 mm long, with a line of hairs at base of lobes. Stamens included; filaments c. 0.2 mm long; anthers shortly oblong, c. 0.4 mm long. Ovules 35–40 per locule. Style 0.2–0.5 mm long, glabrous or hirtellous; stigma bifid; lobes subulate, c. 0.2 mm long, erect, spreading at apex, clavate hairs on inner surface of lobes. Capsule depressed ovoid or broadly ovoid, 1.5–2.5 mm long, 2–2.5 mm wide, slightly furrowed along dissepiment, glabrous; calyx lobes erect, slightly recurved at apex; beak scarcely raised, truncate, not exceeding calyx lobes. Seeds numerous, obconic to depressed obconic, laterally compressed, c. 0.3 mm long; surface light brown, reticulate-areolate.

O. corymbosa has a pantropical distribution but probably is only native to Africa and India. Australian distributional data is presented under varieties.

There are a number of varieties described but only two are recognizable in Australia.

1. Capsule depressed ovoid; flowers solitary or in 2–7-flowered umbel-like corymbs; style glabrous var. **corymbosa**
 Capsule broadly ovoid to subglobose; flowers solitary or in 2-flowered cymes at the nodes, never in groups of 3–7 flowers; style hirtellous var. **caespitosa**

2a. *Oldenlandia corymbosa* var. *corymbosa*

Distinguishing characters are as set out in the above key. **Fig. 2A–C.**

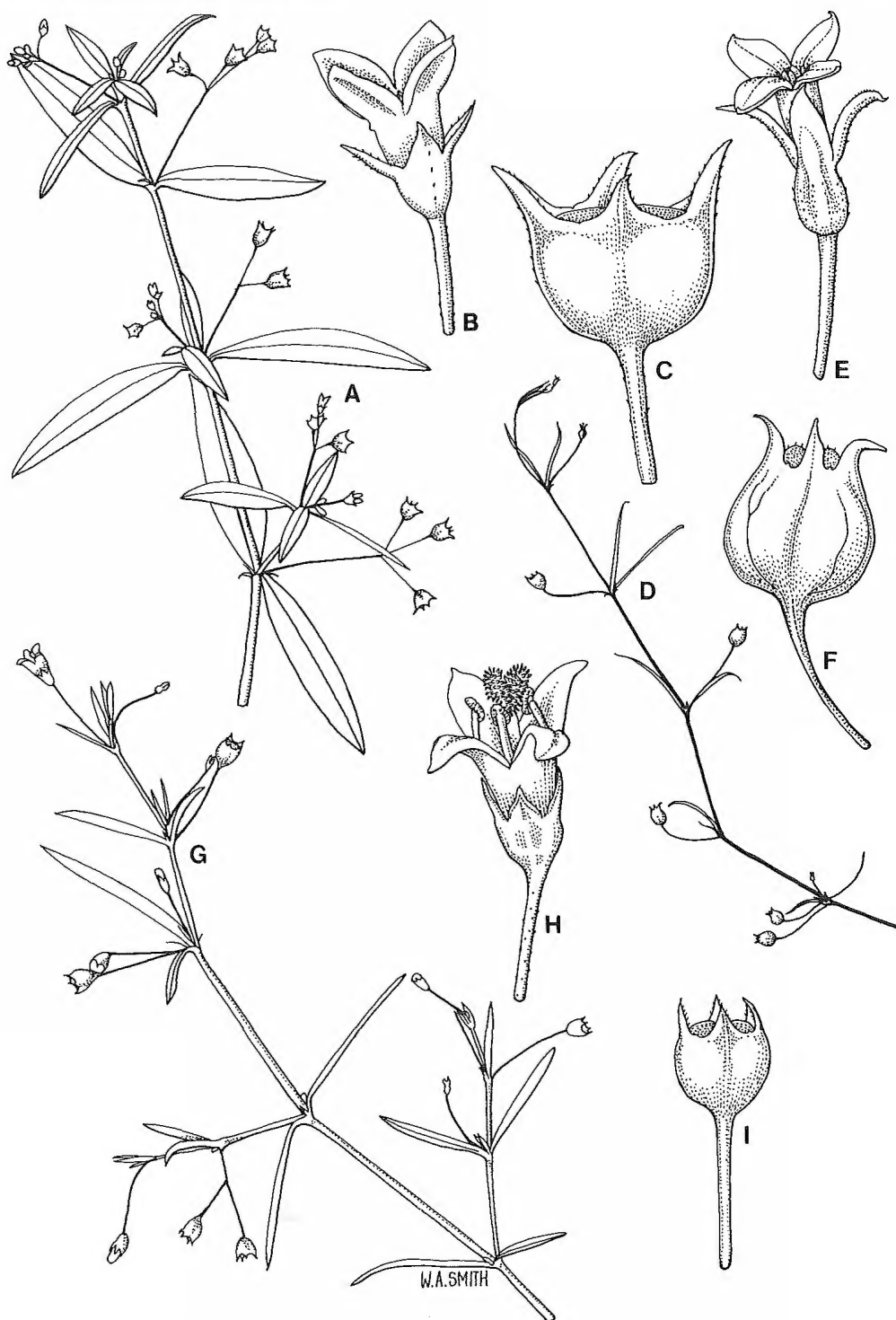


Fig. 2. *Oldenlandia corymbosa* var. *corymbosa*: A. branchlet with inflorescences $\times 1$. B. flower $\times 8$. C. side view of fruit $\times 8$. *Oldenlandia galioides*: D. branchlet with flowers and fruit $\times 1$. E. flower $\times 8$. F. side view of fruit $\times 8$. *Oldenlandia subulata*: G. branchlet with flowers and fruit $\times 1$. H. flower $\times 4$. I. side view of fruit $\times 4$. A-C, Halford Q850; D-F, Halford H66; G-I, Halford Q851.

Selected specimens: **Western Australia.** GARDNER DISTRICT: Amax base camp, Mitchell Plateau, 14°49'S, 125°51'E, Jun 1976, *Hnatiuk* MP82 (PERTH). DAMPIER DISTRICT: One Arm Point, M. Dampierland, 16°26'S, 123°05'E, Nov 1987, *Carter* 145 (PERTH); Broome, 17°58'S, 122°14'E, May 1986, *Kenneally* 9740 (PERTH). **Northern Territory.** DARWIN AND GULF REGION: Point Stuart, 12°21'S, 131°49'E, Jan 1958, *Tulloch* s.n. (DNA); A.I.B., Mitchell Street, Darwin, 12°24'S, 130°50'E, Jun 1964, *Nelson* 1010 (BRI,DNA); Magela Creek, Mudginberri Station, 12°27'S, 132°53'E, May 1983, *Dunlop & Taylor* 6164 (BRI,NSW); Oenpelli, 12°18'S, 133°04'E, Sep 1948, *Specht* 1084 (AD,BRI,CANB,MEL,NSW); Katherine, Boab Caravan Park, 14°28'S, 132°16'E, Apr 1989, *Halford* H10 (BRI). **Queensland.** COOK DISTRICT: Badu Island, Torres Strait, Jan 1980, *Garnett* 367 (BRI); Thursday Island, Douglas Street in main shopping centre, 10°35'S, 142°13'E, Apr 1986, *Clarkson* 6466 (BRI); Weipa camping grounds, 12°41'S, 141°53'E, Aug 1987, *Halford* 1112 (BRI,MEL,NSW); Lizard Island, near airport, 14°40'S, 145°28'E, Oct 1988, *Batianoff* 10350 (BRI); Cooktown, cricketfield, 15°28'S, 145°15'E, May 1989, *Halford* H127 (BRI,K); Abbott Street, Cairns, Jun 1941, *Barnard* 20 (BRI,CANB); Georgetown, C.E. Green Park, 18°17'S, 143°33'E, May 1990, *Halford* Q265 (BRI,MEL). **NORTH KENNEDY DISTRICT:** Townsville – West end at base of Castle Hill, Feb 1980, *Stanley* 8041 (BRI). **SOUTH KENNEDY DISTRICT:** Collinsville area, May 1985, *McIvor* s.n. (BRI); Finch Hatton, 21°02'S, 148°38'E, May 1975, *Andrews & Simon* S4 (BRI). **LEICHHARDT DISTRICT:** Mount Coolon, 21°23'S, 147°20'E, May 1990, *Halford* Q195 (AD,BRI); Emerald, 6 Opal Street, 23°31'S, 148°10'E, May 1989, *Halford* H145 (BRI,MEL).

Distribution and habitat: The first record of *O. corymbosa* var. *corymbosa* in Australia was in 1933 as a weed in the streets of Cairns, Queensland. It is now widespread across northern Australia from Broome to Kununurra in Western Australia, Darwin to Katherine in the Northern Territory and along the east coast from Cape York to near Mackay in Queensland (**Map 2**). It grows in lawns, garden beds and other disturbed areas.

2b. *Oldenlandia corymbosa* var. *caespitosa* (Benth.) Verdc., Kew Bull. 30: 298 (1975); *Oldenlandia herbacea* (L.) Roxb. var. *caespitosa* Benth., in Hook., Niger Fl. 403 (1849); *Oldenlandia caespitosa* (Benth.) Hiern, Fl. Trop. Afr. 3: 61 (1877). **Type: [Africa.] Liberia, Cape Palmas, *Vogel* 51 (holo: K, photo BRI).**

Distinguishing characters set out in the above key.

Specimens examined: **Queensland.** PORT CURTIS DISTRICT: North Rockhampton, Feb 1980, *Stanley* 479 (BRI); Rockhampton, Riverside Municipal Caravan Park, 23°22'S, 150°32'E, May 1990, *Halford* Q154 (BRI); 11 km SE of Miriam Vale on road to Agnes Water, 24°22'S, 151°40'E, May 1990, *Halford* Q151 (BRI); Rosedale, N.C. line, Nov 1932, *Dovey* 168 (BRI). **BURNETT DISTRICT:** Monto Golf Club, Mar 1976, *Romano* [AQ117759] (BRI). **WIDE BAY DISTRICT:** Buss Park, next to Council Chambers, 24°52'S, 152°21'E, Mar 1990, *Halford* Z152 (BRI,K); 23 km SW of Bauple, Glen Echo Road crossing, Munna Creek, *Halford* Q297 (BRI,DNA).

Distribution and habitat: *O. corymbosa* var. *caespitosa* is native of Africa and India. In Australia it grows in coastal districts from Rockhampton to just south of Maryborough (**Map 2**); usually in lawns, on roadsides and other disturbed areas. It was first collected in Australia at Rosedale near Bundaberg in 1932.

Notes: Bremekamp (1952) kept this as a distinct species however Verdcourt (1975) disagreed with this treatment arguing that although the extremes of *O. corymbosa* and *O. caespitosa* are very different there are many specimens difficult to place and he sunk *O. caespitosa* as a variety of *O. corymbosa*. B. Verdcourt (comm. via ABLO (T. Macfarlane)) commented that the Australian material that I had sent to Kew for verification of identification was in fact intermediate between the usual African form of *O. corymbosa* var. *corymbosa* and *O. corymbosa* var. *caespitosa*. There is some debate as to whether there are distinct varieties in this plexus or not. Sivaranjan and Biju (1990) considered *O. corymbosa* var. *caespitosa* unworthy of varietal distinction after studying Indian material and material under cultivation. As the Australian material is quite distinct and easily separable from Australian *O. corymbosa* var. *corymbosa* I have retained it under the name *O. corymbosa* var. *caespitosa*.

3. *Oldenlandia galioides* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Hedyotis galioides* F. Muell., Fragm. 4: 38 (1863). **Type: [Northern Territory. DARWIN AND GULF REGION:] near Adam [MacAdam] Range along the rivulets, October 1855, *Mueller* (lecto (here designated): K(top right hand element)).**

Sprawling, procumbent to ascending, diffuse, annual herbs; branchlets slender, terete or weakly ribbed, glabrous, smooth or minutely tuberculate, often rooting at nodes. Leaves linear to narrow elliptic, (5–)10–30 mm long, (0.2–)0.5–3.0 mm wide, lamina flat or slightly recurved or revolute at least in dry state, glabrous or sparsely covered with minute scabrous hairs, attenuate at base, acute at apex. Stipule-sheath 0.5–1.0 mm long, glabrous, smooth or minutely tuberculate, occasionally produced into triangular lobe, 1.0–1.5 mm long, sometimes bifid; margin entire or fimbriate. Flowers solitary in leaf



Fig. 3. *Oldenlandia spermacocoides*: A. branchlet with inflorescences $\times 1$. B. side view of capsule $\times 6$. *Oldenlandia biflora*: C. branchlet with inflorescences $\times 0.75$. D. side view of capsule $\times 6$. E. flower $\times 6$. A,B, Halford H56; C, Sharpe *et al.* 4475; D,E, Clarkson 6089.

axil or if more than one, with rudiments of branchlet between them; pedicels capillary, 3–17 mm long, not as long as leaves, minutely tuberculate. Calyx-tube subglobose, 0.7–0.9 mm diameter, scabridulous; lobes triangular, 0.8–1.5 mm long, keeled, scabridulous on margin. Corolla white, tubular to narrowly infundibular, glabrous outside; tube 0.7–1.5 mm long, glabrous inside and at throat; lobes linear, 0.5–1.0 mm long. Stamens subsessile; anthers linear, 0.3–0.7 mm long. Ovules 45–60 per locule. Style 0.8–1.5 mm long, glabrous; stigma bifid; lobes subulate, c. 0.5 mm long. Capsule ovoid or ovoid-globose, 1.5–3.0 mm long, 1.0–3.0 mm wide, glabrous or with minute scabrous hairs, laterally compressed; calyx lobes erect; beak 0.5–0.7 mm long, not protruding above calyx lobes, splitting loculicidally, occasionally secondarily splitting septicidally but only above calyx lobes. Seeds numerous, obconic, laterally compressed, c. 0.3 mm long; surface pale brown, reticulate-areolate. **Figs 1A & 2D–F.**

Selected specimens: Papua New Guinea, WESTERN PROVINCE: Lake Daviumbu, Middle Fly River, Aug 1936, *Brass* 7533 (BRI). Western Australia, GARDNER DISTRICT: Near Camp Creek, Mitchell Plateau, 14°52'S, 125°46'E, May 1978, *Kenneally* 6641 (PERTH). FITZGERALD DISTRICT: 'Pentecost Downs', Royston Creek, 16°05'S, 127°20'E, Jun 1982, *Jacobs* 4427 (NSW). CANNING DISTRICT: Gookeys Tank, South Esk Tablelands, 20°15'S, 126°34'E, Apr 1979, *George* 15438 (DNA, PERTH). FORTESCUE DISTRICT: Yule River, Woodstock Station, Apr 1958, *Burbidge* 5955 (AD, CANB, PERTH). Northern Territory, DARWIN AND GULF REGION: Ritjirriur Swamp, Elcho Island, 11°58'S, 135°37'E, Jul 1975, *Latz* 6123 (DNA); Hemple Bay, Groote Eylandt, 13°44'S, 136°42'E, May 1948, *Specht* 362 (AD, BRI, CANB, MEL); South Bay, Bickerton Island, 13°45'S, 136°06'E, Jun 1948, *Specht* 474 (AD, BRI, CANB, MEL, NSW, PERTH); Gulf of Carpentaria, Maria Island, 14°52'S, 135°44'E, Jul 1974, *Dunlop* 2814 (DNA, NSW); 29 miles [46.7 km] W of Tamubirni [Tanumbirini] Homestead, 16°22'S, 134°56'E, Jun 1971, *Henry* 10 (DNA). CENTRAL NORTHERN REGION: Wartupyny Rockhole, 22°48'S, 131°33'E, Jan 1972, *Latz* 2132 (AD, CANB, DNA, NSW, PERTH). Queensland, COOK DISTRICT: Sabai, Torres Strait, 9°23'S, 142°35'E, May 1971, *Lawrie* 8 (BRI); Archer River, Wenlock-Coen Road, 13°27'S, 142°56'E, Jul 1948, *Brass* 19735 (CANB); 90 miles [144.8 km] W of Musgrave Telegraph Office, Jun 1968, *Pedley* 2680 (BRI, MEL). BURKE DISTRICT: Mornington Island, 16°29'S, 139°34'E, Jun 1963, *Tindale & Aitken* s.n. (AD); Sybella Creek, 17 km S of Mt Isa, 20°53'S, 139°27'E, May 1987, *Harris* 174 (BRI). NORTH KENNEDY DISTRICT: Murray Falls, 18°09'S, 145°49'E, Aug 1987, *Halford* 1127 (BRI). PORT CURTIS DISTRICT: N of S end of Curtis Island, towards Connor Bluff, Mar 1966, *Blake* 22571 (BRI). MORETON DISTRICT: Park Ridge, 15 miles [24 km] S of Brisbane, 27°43'S, 153°02'E, Feb 1978, *Sharpe & Elsol* 216 (BRI).

Distribution and habitat: *O. galioides* is widespread across northern Australia from Chester Range, Western Australia to the east coast of Queensland and south to Brisbane (Map 3). It also extends into the Western Province of Papua New Guinea. It grows usually in moist soils, in swamps, along creek banks and beds, and on the edge of ephemeral and permanent waterbodies in woodlands, forests and grasslands.

Conservation status: This species is not considered to be rare or threatened at present.

Typification: Mueller in his protologue refers to material he collected around Victoria River during the Gregory Expedition of Northern Australia and a Bowman specimen from the vicinity of Broad Sound. In the MEL herbarium there is 1) a Mueller specimen [MEL 61483] from the 'Lower Victoria River, May 1856' which consist of four fruiting fragments and two flowering fragments; 2) a specimen [MEL 61482] with a slip of paper label '117 Broudsound' believed to be in Bowman's hand. At Kew there is a Mueller specimen 'Near Adam [MacAdam] range along riverlets, Oct 1855, *F. Mueller*.' The Kew sheet is chosen as lectotype because it is part of the original material and is a better specimen than the ones at MEL. The element in the top right is selected as lectotype because it matches the protologue and has flowers, fruit and leaves all on the one element.

Notes: *O. galioides* has affinities with *O. herbacea* from India and Africa. *O. galioides* is distinguishable by its sprawling, procumbent to ascending habit, and its ovoid or ovoid-globose capsules with a narrow beak that does not extend beyond the persistent calyx lobes. Smith and Darwin (1988) commented that *O. galioides* may not be distinct from *O. tenuifolia*. *O. galioides* is easily distinguished by its tubular or narrowly infundibular corolla tube and its ovoid or ovoid-globose capsules.

4. *Oldenlandia tenuifolia* N. Burman, Fl. Ind. 37 t. 14 f. 1 (1768). **Type:** Java, *D. Pryon* (holo: G).

Oldenlandia tenuifolia J.R. & G. Forster, Fl. Ins. Austr. Prodr. 11 (1786), nom illeg.
Type: [Vanuatu.] Tanna, *J.R. & G. Forster* (holo: BM n.v.).

Hedyotis tenuifolia Smith, in Rees, Cycl. 17 (1811). **Type:** [Vanuatu.] Tanna, *J.R. & G. Forster* (holo: LINN, microfiche BRI).

Oldenlandia aparine S. Moore, J. Bot. 65: 243 (1927). **synon. nov.** **Type:** Papua New Guinea. [GULF PROVINCE:] Ihu, Vailala River, 20 February 1926, *L.J. Brass* 1017 (iso: BRI).

Decumbent annual herbs, sparingly branched; branchlets glabrous, rarely papillose at base, often rooting at nodes. Leaves sessile, linear rarely narrowly elliptic to narrowly obovate, 20–50 mm long, 1–5 mm wide, glabrous or sparsely covered with minute scabrous hairs along margins and on lamina near apex, attenuate at apex and base. Stipule-sheath c. 1 mm long, truncate or produced into triangular lobe with usually 2 or 3 laciniae near apex. Flowers axillary, solitary; pedicels usually stout, somewhat reflexed in mature fruit, 2–10 mm long, glabrous. Calyx-tube globose, 1.5 mm diameter, glabrous; lobes triangular, 1.0–1.5 mm long, glabrous, scabridulous on margin, colleters sometimes present between lobes. Corolla infundibular to broadly tubular, glabrous outside; tube 2.3–2.5 mm long, glabrous at throat; lobes ovate, 1.5–2.5 mm long. Stamens exserted; filaments 0.3–1.0 mm long; anthers linear, c. 0.7 mm long. Ovules numerous in each locule. Style exserted, 2–3 mm long, glabrous; stigma bifid; lobes clavate, 0.5–1.3 mm long. Capsule subglobose, 2.5–3.5 mm diameter, glabrous, not markedly furrowed along dissepiment; calyx lobes erect; beak 0.4–0.8 mm long, rounded, not protruding above calyx lobes. Seeds numerous, depressed obconic; surface brown, reticulate.

Selected specimens: Northern Territory. DARWIN AND GULF REGION: Girraween Lagoon, 4 km E of Stuart Highway along Girraween road, 12°31'S, 131°05'E, Apr 1983, *Briggs* 779 (BRI); Jabiru, Retention Dam 1, 12°40'S, 132°54'E, Apr 1983, *Henshall* 4009 (DNA, MEL); Channel Point, 13°08'S, 130°15'E, Oct 1986, *Clark & Wightman* 12 (DNA). Queensland. COOK DISTRICT: near Cooktown, May 1970, *Blake* 23287 (BRI, MEL, NSW). NORTH KENNEDY DISTRICT: Braemeadows, Ingham, Feb 1962, *Webb & Tracey* 5865 (BRI).

Distribution and habitat: *O. tenuifolia* occurs from Channel Point to Jabiru, Northern Territory and near Cooktown and Ingham, Queensland (**Map 4**), and eastern Malesia. It grows on damp soils in *Melaleuca* swamps, tropical wet grasslands, or monsoon forests.

Notes: Burman (1768) described *O. tenuifolia* based on a specimen collected by Pryon from Java. Forster (1786) further interpreted *O. tenuifolia* based on material he and his father collected on Tanna, Vanuatu (New Hebrides). Smith (1811) considered the Pryon specimen to belong to the Linnaean *H. herbacea* (*O. herbacea*) while he used the Forster specimen for a new species *H. tenuifolia*. The Pryon specimen is only a small fragment but has a well preserved flower which shows a broad tubular corolla and a rather stout glabrous pedicel. In contrast *O. herbacea* (*H. herbacea*) has a narrow cylindrical corolla and slender pedicels. I disagree with Smith's statement that Burman's species belongs to *H. herbacea* and I consider the Pryon and Forster specimens to belong to the same taxon which is distinct from the Linnean species *O. herbacea* (*H. herbacea*). The correct name for this taxon is *Oldenlandia tenuifolia* N. Burman. In flower and seed morphology *O. tenuifolia* N. Burman closely resembles *O. subulata* Korth. However, *O. tenuifolia* is distinguishable by its stout, glabrous pedicels which are mostly reflexed when with fruit, its axillary, solitary flowers and its sparsely branched stems.

It is somewhat variable in pedicel length and appears to intergrade with *O. brachypoda* DC. which occurs in India and Malesia. Investigations into this species complex may reveal that these taxa would probably best be considered at subspecific rank.

5. *Oldenlandia subulata* Korth., Ned. Kruidk. Arch. 2: 153 (1851). **Type:** Borneo, Poeloe-Lampe, *Korthals* (holo: PR(PR908219-458)).

Sprawling or ascending annual herbs, sparingly branched; branchlets terete or slightly ribbed, glabrous, smooth or sparsely to moderately papillose, often rooting at nodes. Leaves sessile, linear, 2.0–5.5 mm long, 1–3 mm wide, glabrous or sparsely to moderately covered with scabrous hairs above, glabrous below, attenuate at base and apex. Stipule-sheath 0.5–1.5 mm long, glabrous or nearly so, produced into triangular lobe, 1.0–1.5 mm long, with usually 1–3 laciniae near apex. Flowers axillary, solitary, very rarely paired on peduncles or in lax terminal monochasial cymes; pedicels slender, 6–25 mm long, papillose. Calyx-tube globose, 1–2 mm diameter, glabrous; lobes triangular to narrowly ovate, 1.0–2.5 mm long, keeled, scabridulous on margin. Corolla white rarely blue, infundibular to broadly tubular, glabrous outside; tube 1.5–3.5 mm long, glabrous

at throat; lobes oblong, 1.5–3.5 mm long. Stamens exerted from tube; filaments 1.0–1.5 mm long; anthers linear, 0.6–1.0 mm long. Ovules 70–100 per locule. Style exerted from tube, 2.5–4.0 mm long, glabrous; stigma bifid; lobes clavate, 1.0–1.7 mm long. Capsule subglobose, 2.5–3.5 mm diameter, glabrous, not markedly furrowed at dissepiment; calyx lobes erect; beak 1–2 mm long, rounded, not protruding above calyx lobes. Seeds numerous, depressed obconic, laterally compressed, c. 0.3 mm long; surface pale brown, reticulate-areolate. **Fig. 2G–I.**

Selected specimens: Queensland. COOK DISTRICT: Unigan Nature Reserve, Weipa, Mar 1990, *Forster* PIF6500 & *O'Reilly* (BRI,DNA,MEL,K,L,PERTH,QRS); Claudie scrub, 12°45'S, 143°16'E, Apr 1988, *Forster* PIF4201 & *Liddle* (A,BISH,BRI,DNA,LAE,MO); Leo Creek, upstream from falls, on eastern fall of McIlwraith Range, 13°40'S, 143°23'E, Jul 1978, *Clarkson* 2384A (BRI); Lizard Island, 14°40'S, 145°27'E, May 1975, *Brynes* 3116 (BRI). NORTH KENNEDY DISTRICT: Hinchinbrook Island, little Ramsay Bay, on eastern side of island, Aug 1975, *Sharpe* 1597 (BRI). PORT CURTIS DISTRICT: Northumberland Islands, Sep 1802, *Brown* s.n. (CANB); 'Raspberry Vale' 1 mile [1.6 km] from homestead, 22°34'S, 150°23'E, Apr 1945, *Blake & Webb* 15560 (BRI); S.F. 365, Mount Stowe, 6.5 km SE of Yarwun, 23°54'S, 151°09'E, Jun 1988, *Gibson* TO1360 (BRI). MORETON DISTRICT: On David Low Highway, Maroocha, c. 5 km S of Coolumb Beach, 26°34'S, 153°05'E, May 1988, *Sharpe* 4801 (BRI); Near Banyo, May 1932, *Blake* s.n. (BRI).

Distribution and habitat: In Australia *O. subulata* is chiefly coastal from Cape York Peninsula to South East Queensland, also on offshore islands (**Map 5**). It occurs on moist soils in swamps, on lagoon margins and along creek banks mostly in *Melaleuca* forests or woodlands, or heathlands. It has been occasionally recorded growing with *O. galioides*.

Conservation status: This species is not considered to be rare or threatened.

Notes: The collections included by me in *Oldenlandia subulata* had been determined previously as *O. herbacea* (*H. herbacea*) in Australia and New Guinea. I have examined collections of *O. herbacea* from India and Africa including the type and have found them to be quite distinct from the species considered here. In *O. subulata* the corolla is broadly tubular to campanulate, with the corolla tube scarcely longer than the erect lobes of the calyx, and the rounded apex of the subglobose-ovoid capsule shorter than the erect calyx lobes. In contrast *O. herbacea* the corolla is narrowly cylindrical, with the tube usually exceeding the calyx lobes by 1.5 times, and the drawn out apex of the subglobose capsule extended above the small adpressed calyx lobes.

6. *Oldenlandia polyclada* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Hedyotis polyclada* F. Muell., Fragm. 8: 146 (1874). Type: [Queensland. NORTH KENNEDY DISTRICT:] Rockingham Bay, undated, *Dallachy* (lecto (here designated): MEL(MEL 61484)).

Low spreading herbaceous perennial, densely branched; branchlets quadrangular and hispidulous when young becoming rounded and glabrous with age. Leaves sessile, linear to narrowly elliptic or narrowly obovate, 7–40 mm long, 2–6 mm wide, discolorous, glabrous or with minute scabrous hairs above, glabrous below, attenuate at base, acute at apex with mucronate, midrib prominent below. Stipule-sheath c. 1 mm long, hispidulous, produced into triangular lobe, 1.0–1.5 mm long; margin fimbriate. Inflorescences terminal 2–8-flowered fascicles, rarely flowers solitary; pedicels slender, 3–6 mm long, glabrous or hispidulous. Calyx-tube subglobose, c. 1.5 mm diameter, glabrous; lobes ovate-triangular or linear-lanceolate, 2–8 mm long, joined at base into free tube, entire or serrulate on margin, mucronate at apex. Corolla pale rose, infundibular to broadly tubular, sparsely pubescent outside; tube 2.5–4.0 mm long, sparsely pubescent inside; lobes linear to semi-lanceolate, 2.5–3.5 mm long, sparsely pubescent inside. Stamens exerted; filaments, 1.5–2.0 mm long; anthers linear-oblong 1.5–2.0 mm long. Ovules c. 30–40 per locule. Style exerted, 6–7 mm long; stigma simple or bifid; lobes linear, c. 1 mm long. Capsule subglobose, 2.0–2.5 mm diameter, glabrous or nearly so, not markedly furrowed along dissepiment; calyx lobes spreading; beak c. 1 mm long, rounded, not protruding above calyx lobes. Seeds numerous, depressed obconic, obtriangular in outline, laterally compressed, c. 0.5 mm wide; testa brown, reticulate-areolate. **Fig. 4.**

Specimens examined: Queensland. COOK DISTRICT: Barrons Range, 'Kings Plains', SW of Cooktown, 15°37'S, 145°05'E, Jun 1983, *Godwin* C2420 (BRI); ditto, *Godwin* C2423 (BRI). NORTH KENNEDY DISTRICT: cultivated from cuttings collected from top of Tully Falls, 17°47'S, 145°34'E, undated, *Hockings* [AQ339001] (BRI).

Distribution and habitat: *O. polyclada* is known only from the Barron Range, south west of Cooktown and in the Cardwell Range west and south west of Tully in Queensland

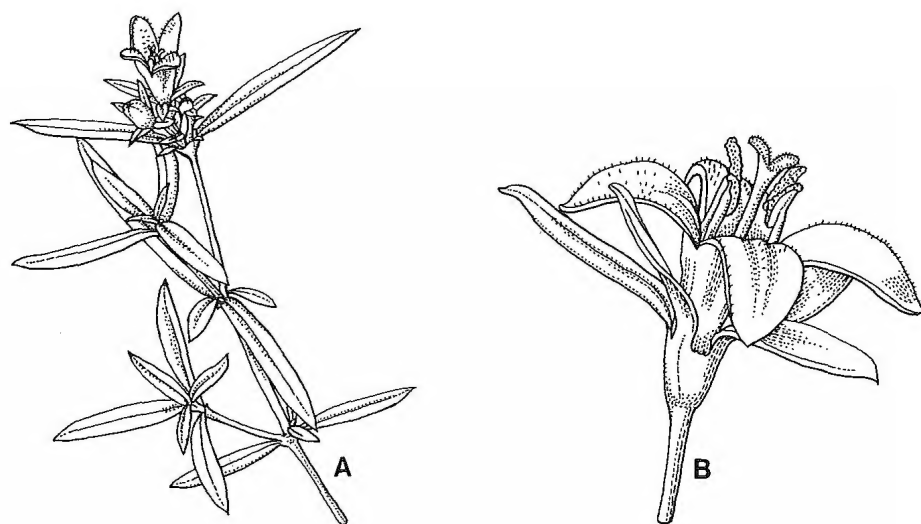


Fig. 4. *Oldenlandia polyclada*: A. branchlet with inflorescence $\times 1$. B. flower $\times 4$. A, B, Halford Q852.

(Map 6). The only habitat information for this species is from the Barron Range specimen 'semi-evergreen, mixed vine thicket on limestone and sandstone, sandy loamy soils'.

Conservation status: The species has a range of 340 km but has only been collected twice since the original collections were made by Dallachy last century. The species has been collected in the Tully Falls National Park. A conservation coding of 3RC is appropriate.

Typification: In his protologue Mueller refers to a Dallachy specimen collected at Rockingham Bay. On examination of material from K and MEL there are four specimens collected by Dallachy that could be part of the material Mueller base this taxon on. One specimen MEL 115103 has the following notes recorded on it in Dallachy's handwriting: 'Friday 10 September 1869 Mount Graham Peak growing in the [illegible word] of the peak foliage a lime dark green flowers very pale pink [illegible word]'. This specimen is dated before the publication of the name; however the leaf length of most of the elements on the sheet does not match the dimensions given in the protologue (they are 4–20 mm long (mostly shorter than 8 mm long) compared to 8.5–17.0 mm long in the protologue). The other three specimens are undated with label information in Mueller's hand 'Rockingham Bay Dallachy'. The specimen MEL 61484 is select as lectotype because it fits Mueller's description and has flowers and capsules present.

7. *Oldenlandia tenelliflora* (Blume) Elmer var. *papuana* Valeton, Nova Guinea 14: 243, pl 22, fig. A, 1–5 (1925); *Hedyotis tenelliflora* Blume var. *papuana* (Valeton) Merr. & Perry, J. Arnold Arbor. 26(1): 3 (1945). **Syntypes:** [Indonesia. Irian Jaya:] Sudabh. Swart-Fluss 1250 m in einem Acker der Papoeas, 24 Nov 1920, *Lam* n.2965, *n.v.*; Westabhang Swart-Tal 1400 m, offene Grasflache, 24 Nov 1920, *Lam* n. 2085, *n.v.*

Procumbent herbs; branchlets tetragonous, glabrous, smooth or sometimes tuberculate on ribs. Leaves linear, 15–40 mm long, 1–2 mm wide, glabrous or with scabrous hairs along margin and on lamina near apex, rounded or truncate at base, acute at apex with mucro; sessile or shortly petiolate, petiole 0.5 mm long. Stipule-sheath 1.0–1.5 mm long, glabrous or pubescent, truncate or rounded with 2–5 setae, 2–3 mm long. Inflorescences axillary, 2–4-flowered subsessile cymes; pedicels c. 1 mm long. Calyx-tube subglobose, c. 1 mm diameter, glabrous; lobes narrowly triangular, 1.5–2.0 mm long, joined at base into free tube, scabridulous on margin. Corolla white, infundibular, glabrous outside;

tube 1.5–2.0 mm long, glabrous at throat; lobes linear-oblong, 1.5–2.0 mm long, acute at apex. Stamens exserted; filaments filiform, 1.0–1.5 mm long; anthers linear, 0.8–0.9 mm long. Ovules numerous in each locule. Style terete, 3.0–3.5 mm long, glabrous; stigma bifid; lobes linear, 0.3–0.6 mm long. Capsule ovoid to subglobose, 2.0–2.5 mm diameter, glabrous; calyx lobes erect; beak narrow, c. 0.8 mm long, not protruding above calyx lobes. Seeds depressed obconic, laterally compressed, c. 0.5 mm wide; surface brown, reticulate-areolate.

Specimens examined: Indonesia. Irian Jaya: Balim River, Dec 1938, *Brass* 11628 (BRI). Papua New Guinea. CENTRAL PROVINCE: Mafulu, Sep–Nov 1933, *Brass* 5152 (BRI). PROVINCE UNKNOWN: Hayfield, Kungingini Road, Dec 1954, *Womersley & Simmonds* 6875 (BRI); Australia. Queensland. COOK DISTRICT: Daintree River, 1890, *Pentzke* [MEL 115134] (MEL).

Distribution and habitat: *O. tenelliflora* var. *papuana* is recorded from New Guinea; within Australia it is known only from the Daintree River area, north of Mossman, Queensland (Map 6). No ecological information is available.

Conservation status: In Australia this variety is known from one collection made 100 years ago. A preliminary search of likely localities in the Daintree River area was undertaken in September 1990 but no new collections were made. More field investigations are required before considering the species as extinct in Australia. A conservation coding of 2K is appropriate.

8. *Oldenlandia argillacea* (Halford) Halford, **comb nov.**

Hedyotis argillacea Halford, *Austrobaileya* 3: 203 (1990) **Type:** Northern Territory. DARWIN AND GULF DISTRICT: 6 km NE of Cape Crawford Roadhouse towards Borroloola, 30 April 1989, *D. Halford* H93 (holo: BRI; iso DNA, K, PERTH).

See Halford (1990) for a description, illustration and notes on distribution.

9. *Oldenlandia coerulescens* (F. Muell.) F. Muell., *Syst. cens. Austral. pl.* 74 (1882); *Hedyotis coerulescens* F. Muell., *Fragm.* 4: 38 (1863). **Type:** [Queensland. LEICHHARDT DISTRICT:] Peak Downs, undated, *Mueller* (lecto: (here designated): MEL (MEL 61480); isolecto: K).

Erect annual herbs to 30 cm high, usually much branched from near the base; branchlets tetragonous becoming terete, sometimes with minute scabrous hairs on ribs otherwise glabrous. Leaves sessile, linear to lanceolate, 15–25 mm long, 1.0–2.5 mm wide, glabrous or with minute scabrous hairs above, attenuate at base, acute at apex. Stipule-sheath 1–1.5 mm long, truncate or produced into triangular lobe; margin entire or with 1–3 fimbriae. Inflorescences lax, terminal dichasial cymes with leaf-like bracts decreasing in size towards apex. Flowers solitary or paired at nodes; pedicels 2–10 mm long. Calyx-tube obloid-ellipsoid, 1.0–3.0 mm long, 0.5–1.5 mm wide, with minute scabrous hairs; lobes ovate, 0.7–1.3 mm long, slightly keeled, glabrous, scabridulous on margin. Corolla white, pale pink or mauve, glabrous outside; tube short 0.5–1.0 mm long, glabrous at throat; lobes linear-oblong, 2.0–4.5 mm long, geniculate at c. 1/3 to 1/4 of their length from tube, with a line of hairs on lobes at knee. Filaments 0.3–0.5 mm long; anthers linear-oblong, 0.5–0.8 mm long. Ovules 20–50 per locule. Style terete, 0.3–1.0 mm long; stigma bifid; lobes filiform, c. 0.5 mm long, erect. Stamens and style exserted from corolla tube but enclosed by lobes, overtopped by ring of hairs. Capsule obloid-ellipsoid, 4–5 mm long, 2.5–3 mm wide, glabrous, furrowed along dissepiment; calyx lobes erect slightly recurved at apex; beak 0.5 mm long, retuse-truncate, not protruding above calyx lobes. Seeds numerous somewhat scutelliform, broadly elliptic in outline, 0.5–0.7 mm wide; surface dark brown, reticulate-foveate.

Selected specimens: Queensland. BURKE DISTRICT: 54 km NNW of Hughenden, c. 1 km N of Lookout at Porcupine Gorge, 20°24'S, 144°28'E, May 1990, *Halford* Q211 (AD, BRI, DNA, MEL, PERTH). GREGORY NORTH DISTRICT: 6 km N of Coolibah Bore, Headingley Station, 21°08'S, 138°24'E, May 1985, *Neldner & Stanley* 1803 (BRI); 15 km of Winton along road to Boulia, 22°21'S, 142°53'E, May 1990, *Halford* Q278 (BRI, K). MITCHELL DISTRICT: 34 miles [54.7 km] NW of Longreach, 22°55'S, 143°05'E, Feb 1953, *Davidson* 326 (BRI); 46 km E of Longreach along road to Barcaldine, 23°31'S, 144°39'E, May 1990, *Halford* Q285 (BRI); c. 7 km N of Jundah, 24°48'S, 143°07'E, May 1988, *Nicolson & Novelty* 73 (BRI); Malvern Hills, c. 25 miles [40.2 km] W of Blackall, May 1949, *Everist* 3807 (BRI). SOUTH KENNEDY DISTRICT: 8 miles [12.9 km] W of 'Avon Downs' Station, Jul 1964, *Adams* 1048 (BRI, CANB); 120 km NW of Clermont, 22°03'S, 147°06'E, Jul 1977, *Dale* 153 (BRI). LEICHHARDT DISTRICT: 85 km SW of Mackay, 37 km NW from Peak Downs Highway along Suttor Development Road, 21°33'S, 148°21'E, May 1990, *Halford* Q177 (BRI); 64 km W of Emerald along Capricorn Highway, 23°35'S,

147°39'E, May 1990, *Halford* Q294 (BRI); 'Codenwarra', 8 miles [12.9 km] E of Emerald, 1978, *Godwin* AC214 (BRI). PORT CURTIS DISTRICT: Gracemere, Feb 1869, *O'Shanesy* 1059 (MEL). WARREGO DISTRICT: 'Airlie', Wyandra, 120 km S of Charleville, Mar 1984, *Silcock* s.n. [AQ399745] (BRI).

Distribution and habitat: *O. coerulescens* is found across central Queensland from Urandangie to Rockhampton and south to Wyandra (Map 7). It grows on heavy clay soils mostly in *Astrelba* spp. grasslands, mixed herblands and *Acacia* spp. woodlands.

Conservation status: This species is not considered rare or threatened at present.

Typification: When Mueller (1863) described *Hedyotis coerulescens* he referred to material that he would have collected on the final stages of the Gregory Expedition of Northern Australia in late 1856. There are two sheets at MEL labelled as 'Type specimens' for *Hedyotis coerulescens*. MEL 61480 has a single element and an annotation in Mueller's hand 'Peak Downs, scrub and plains [illegible word]'. There is a sheet at Kew which is a duplicate of the MEL 61480 consisting of two elements with a label in Mueller's hand 'Peak Downs'. The other MEL specimen (MEL 61479) consists of five elements all of this species and has two labels in Mueller's hand. One in the bottom right has 'Issacs River, Bowman' the other in the top left has 'Nichol Bay W.A. 1876'. It seems highly unlikely that this second label belongs to any of the material on the sheet as *Hedyotis coerulescens* has not been collected any further west than Urandangie, Queensland. As the material is undated and Mueller did not refer to any Bowman material in his protologue there is doubt that it was part of the original material that Mueller used in drawing up his circumscription of the species. The MEL sheet MEL 61480 is here designated as lectotype as it is part of the original material and agrees with the original description.

Notes: Bentham (1866) in his treatment of this species under *Hedyotis* notes that it 'is closely allied to the East Indian *Hedyotis maritima* [= *Hedyotis graminifolia* L. f.] and further specimens may possibly show it to be a variety only'. Although the habit and capsule shape are similar in both taxa, a close examination of *H. graminifolia* show it to be quite distinct in flower structure and seed morphology.

10. *Oldenlandia crouchiana* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Hedyotis crouchiana* F. Muell., Fragm. 10: 85 (1876). Type: [Western Australia. FORTESCUE DISTRICT:] Nichol Bay, 1876, *Mrs Crouch* (holo: MEL(MEL 61481); iso: K).

Low spreading to erect annual herbs, to 20 cm high, much branched from base; branchlets stout, somewhat woody, tetragonous to tetraquetrous, 4-ribbed, glabrous except for laterally compressed conical hairs on ribs. Leaves narrowly lanceolate or narrowly elliptic, 15–40 mm long, 3–8 mm wide, glabrous or sparsely covered with scabrous hairs above, on margin and on midrib below, attenuate at base, acute to acuminate at apex. Stipule-sheath 1–2 mm long, glabrous or with erect, triangular hairs, truncate or produced into triangular lobe; margin with 2–8 laciniae. Inflorescences terminal cymes; peduncles once or twice dichasially branched with each ultimate branch ending in monochasial cymes; pedicels 2–8 mm long; bracts leaf-like up to 15 mm long. Calyx-tube obloid, 2.0–3.5 mm long, 1.5–2.0 mm wide, glabrous, smooth or papillose; lobes ovate, 2.5–4.5 mm long, glabrous or sparsely covered with scabrous hairs, joined at base to form a free tube. Corolla blue; tube 1.0–1.5 mm long, glabrous at throat; lobes linear or narrowly obovate, 3.0–6.5 mm long, geniculate at c. 1/5 of their length from tube, with a dense transverse line of hairs on lobes at knee. Filaments 0.3–0.5 mm long; anther oblong, 0.5–1.0 mm long. Ovules c. 40–50 per locule. Style 1.0–1.5 mm long; stigma bifid; lobes erect, c. 1 mm long, subulate. Stamens and style exerted from corolla tube but enclosed by lobes, overtopped by ring of hairs. Capsule obloid, 3.5–6.0 mm long, 3.5–4.5 mm wide, glabrous or with laterally compressed conical hairs along vascular traces, furrowed along dissepiment; calyx lobes erect; beak c. 0.7 mm long, truncate, not protruding above calyx lobes. Seeds numerous, cerebriform, depressed ovate in outline; surface black, reticulate-foveate.

Selected specimens: Western Australia. DAMPIER DISTRICT: 1 km S of Geikie Gorge, Geikie Hills, 18°05'S, 125°42'E, Apr 1988, *Cranfield* 6422 (PERTH); Gogo Station, Fitzroy Crossing, May 1962, *Royce* 7009 (PERTH). FORTESCUE DISTRICT: 2 km NE of campsite, Barrow Island, 20°49'S, 155°25'E, Jun 1964, *Goodall* 1302 (PERTH); Dampier Archipelago, NW Roebourne, Jun 1962, *Royce* 7341 (PERTH); near old construction camp, Shay Gap,

c. 160 km E of Port Headland, 20°30'40"S, 120°08'40"E, Jul 1984, *Newbey* 10295 (PERTH); Hamersley Range, near Mt Rica, Oct 1941, *Gardner* 6400 (PERTH); 1 mile [1.6 km] E of Millstream Homestead, Mar 1962, *George* 3538 (PERTH); 88.9 km S of Marble Bar on track to Nullagine, 21°42'S, 120°12'E, Jun 1981, *Kenneally* 7685 (PERTH); 19 km SSW of Tanguin Hill, c. 135 km SE of Shay Gap, 21°00'00"S, 121°08'30"E, Jul 1984, *Newbey* 10548 (PERTH); Duck Creek, 8 km NE of Quarry Hill, c. 120 W of Tom Price, 22°28'10"S, 116°37'50"E, Aug 1984, *Newbey* 10664 (PERTH); Mount Brockman Station, Aug 1973, *Demarz* 4423 (PERTH); Kalamina Gorge, Wittenoom area, May 1966, *Blockley* 221 (PERTH); Shale Ridge, Newman, Jul 1981, *Deighton* 99 (PERTH). CARNARVON DISTRICT: North West Cape, lighthouse hill, Aug 1960, *George* 1398 (PERTH). ASHBURTON DISTRICT: Barlee Range, Henry River, 23°44'S, 116°19'E, Aug 1961, *Royce* 6496 (PERTH). KEARTLAND DISTRICT: near Rudall River, May 1971, *George* 10690 (PERTH); Rudall River area, 22°35'S, 122°10'E, Aug 1971, *Wilson* 10556 (PERTH).

Distribution and habitat: *O. crouchiana* occurs in the north west of Western Australia from Cape Range to near Fitzroy Crossing (**Map 8**). It grows on shale ridges and basalt hills in well drained gravelly and sandy soils in hummock grasslands, and along drainage lines in gravelly to sandy loams in *Eucalyptus camaldulensis* low woodlands.

Conservation status: This species is not considered to be rare or threatened at present.

11. Oldenlandia spathulata Halford, **sp. nov.** arcte affinis *O. crouchianae* a qua distiguenda corollae lobis spathulatis et capsulis eius obloido-ellipsoidalibus, 6–9 mm longis, 3–4 mm latis, vice capsulis *O. crouchianae* obloideis, 3.5–6.0 mm longis, 3.5–4.5 mm latis. **Typus:** Queensland. BURKE DISTRICT: Along Donors Hill – Burketown road. Upper Alexandra River (Landsborough R.) branch of the Leichhardt River near 'Talawanta', 18°37'S, 140°15'E, 26 April 1974, *R. Pullen* 8916 (holo: BRI; iso: CANB).

Ascending to erect annual herbs to 30 cm high, branched from base; branchlets tetragonous, glabrous, smooth or tuberculate along ribs. Leaves sessile, linear or linear-lanceolate, 25–60 mm long, 2–6 mm wide, glabrous, attenuate at base, acute at apex. Stipule-sheath 1–1.5 mm long, glabrous, fimbriate on margin. Inflorescences terminal cymes; peduncles once or twice dichasially branched with each ultimate branch ending in monochasial cymes. Flowers usually borne in pairs at nodes on unequal pedicels; pedicels stout, 2–25 mm long, glabrous; bracts leaf-like up to 20 mm long, 1 mm wide. Calyx-tube obloid, 2.0–4.0 mm long, 1.5–2.0 mm wide, glabrous; lobes ovate, 1–2 mm long, joined at base to form a free tube, colleters present between lobes. Corolla pale blue, glabrous outside; tube short, 0.5–1.0 mm long, glabrous inside, flat undulate outgrowths from corolla tube in throat; lobes spathulate, 6–8 mm long, 2.0–2.5 mm wide; margin pilose with long moniliform hairs. Stamens exserted; filaments 4–5 mm long, attached at sinus between lobes; anthers oblong, 1.5–2.0 mm long. Ovules numerous in each locule. Style 5.0–7.0 mm long; stigma bifid; lobes obtuse, 0.3–0.8 mm long, reflexed at apex. Capsule obloid-ellipsoidal, 6.0–9.0 mm long, 3.0–4.0 mm wide, glabrous, furrowed along dissepiment; calyx lobes erect, recurved at apex; beak rounded, c. 1 mm long, not protruding above calyx lobes. Seeds numerous, cerebriform, depressed obovate in outline, 0.5–0.7 mm wide; surface black, verrucate. **Figs 1F & 5A–D.**

Specimens examined: Queensland. BURKE DISTRICT: Alexandra River crossing along road to Burketown, Talawanta Station, 18°37'S, 140°16'E, Jun 1991, *Halford* Q466 (BRI).

Distribution and habitat: *O. spathulata* is only known from the type locality on Talawanta Station, Queensland (**Map 8**). It grows in a low open eucalypt woodland with annual grasses on a grey silty clay soil.

Distinguishing features: *O. spathulata* is closely related to *O. crouchiana*. It can be distinguished from this species by its spathulate corolla lobes, and longer obloid-ellipsoidal capsule, 6–9 mm long, 3–4 mm wide as compared to the obloid capsule, 3.5–6 mm long, 3.5–4.5 mm wide of *O. crouchiana*.

Conservation status: I have been unable to find any more populations of this species during two field trips (April 1989 and May 1990) to the area. The area for several years has had well below average rainfall which has produced poor seasons for annuals. Further field studies during more conducive wet seasons are required to ascertain its full distribution. A conservation coding of 1K is considered appropriate.

Etymology: The specific epithet refers to the shape of the corolla lobes.



Fig. 5. *Oldenlandia spathulata*: A. habit $\times 0.4$. B. side view of capsule $\times 4$. C. flower $\times 4$. D. corolla opened out $\times 4$. *Oldenlandia kochiae*: E. side view of capsule $\times 8$. F. branchlet of inflorescence $\times 1$. A, Pullen 8916; B-D, Halford Q466; E, F, Carr 3100 & Beauglehole 416859.

- 12. *Oldenlandia spermacocoides*** (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74. (1882); *Hedyotis spermacocoides* F. Muell., Fragm. 8: 146 (1874) (as 'spermacociodes').
Type: Sturt's Creek, Feb 1856, *F. Mueller* (holo: MEL(MEL 61486)).

Compact procumbent or ascending annual herbs to 30 cm high; branchlets tetragonous, 4-ribbed, hispidulous to hispid, or rarely glabrous. Leaves sessile linear, narrow elliptic or oblanceolate, 15–35 mm long, 1–8 mm wide, hispid or rarely papillose on upper and lower surfaces, attenuate at apex and base. Stipule-sheath c. 1 mm long, truncate with 1–3 fimbriae or produced into triangular lobe sometimes deeply divided. Inflorescences axillary or terminal fascicles, 3–8-flowered, rarely 1 or 2 or more than 8; pedicels 1–4 mm long. Calyx-tube subglobose, c. 1.5 mm diameter, hispid or papillose; lobes triangular, 3–4 mm long, keeled, hispid or papillose. Corolla white, hispidulous outside; tube short, 0.5–1.5 mm long, glabrous at throat; lobes 1.5–2.5 mm long, geniculate at c. 1/4 of their length from the tube, with a transverse line of hairs on lobes at knee. Filaments c. 1 mm long; anthers oblong, c. 0.8 mm long. Ovules 15–20 per locule. Style 1.5–2.0 mm long; stigma bifid; lobes short. Stamens and style exerted from corolla tube but enclosed by lobes, overtopped by ring of hairs. Capsule subglobose, 2–4 mm long, 2.5–4.5 mm wide, laterally compressed, furrowed along dissepiment, or hispid rarely papillose; calyx lobes erect, recurved at apex; beak truncate, not protruding above calyx lobes. Seeds numerous, cerebriiform, depressed obovate in outline, c. 1 mm wide; surface dark reddish brown, reticulate-foveate. **Figs 1E & 3A & B.**

Selected specimens: Western Australia. GARDNER DISTRICT: Mitchell River, 14°50'S, 125°42'E, Feb 1980, *Dunlop* 5286 (BRI,DNA,PERTH); c. 15 km N of Kalumburu Mission, 14°11'S, 126°41'E, May 1983, *Fryxell & Craven* 4126 (PERTH); King Edward River, old CRA campsite, 1 km S of track to old Mitchell River Station, 15°08'S, 126°09'E, Jun 1988, *Edinger* 543 (PERTH); Hidden Valley, just E of Kununurra, Apr 1977, *George* 14534 (PERTH). HALL DISTRICT: Piccaninny Creek Gorge, 15 km SE of Bungle Bungle Outcamp, Bungle Bungle Range, 17°27'S, 128°25'E, Apr 1985, *Blackwell* BB17 (PERTH). NORTHERN TERRITORY. VICTORIA RIVER REGION: 33 km E of Kununurra, Aboriginal Painting site, Keep River National Park, 15°48'S, 129°02'E, Apr 1989, *Halford* H56 (BRI); Upper Victoria River, Jan 1856, *Mueller* s.n. (K); 7 km N Mt Sanford Station, 16°56'S, 130°35'E, [date not recorded], *Latz* 5345 (AD,DNA); Victoria River Crossing, 16°20'S, 131°07'E, May 1968, *Byrnes* NB715 (DNA).

Distribution and habitat: *O. spermacocoides* occurs from the Mitchell River, Western Australia east to the Victoria River, Northern Territory (**Map 8**). It grows chiefly on shallow sandy soils on creek levees or rocky slopes associated with sandstone outcrops, hills and escarpments in open woodlands.

Conservation status: This species is not considered to be rare or threatened at present.

Notes: *O. spermacocoides* is closely related to *O. crouchiana*. It is easily distinguished by its fasciculate inflorescences and subglobose capsules. The typical form of this species has branchlets, leaves and capsules covered with a hispid indumentum. Plants from King Edward River (*Edinger* 372 & 543) and Pauline Bay (*Forbes* 2168) have glabrous branchlets and leaves and capsules covered with a short papillose indumentum.

Mueller in the protologue and on specimens he examined spelt the specific epithet 'spermacociodes'. Later in his 'Systematic Census of Australian Plants' (1882) he used the spelling 'spermacocoides' without giving any explanation for the change. The derivation of the specific epithet comes from the genus *Spermacoce*, and the latin suffix *-oides* resemblance, alluding to the resemblance of the taxon to some species of the genus *Spermacoce*. I am uncertain what Mueller had in mind with his early spelling. The spelling 'spermacocoides' should be used in accordance with article 73.8 of the International Code of Botanical Nomenclature (1983) which allows the incorrect compounding form of an epithet to be corrected.

- 13. *Oldenlandia kochiae*** Halford, **sp. nov.** olim confusa *O. mitrasacmoide* a qua habitu infirme ascendente, semenibus obconicis et floribus capsulisque parvioribus facile distiguenda. **Typus:** Western Australia: Angustus Island, Bonaparte Archipelago, 15°25'S, 124°35'E, 15 May 1972, *P.G. Wilson* 10806 (holo: PERTH).

Weakly ascending herbs to 40 cm high; branchlets weakly ribbed, glabrous, smooth or tuberculate on ribs. Leaves sessile, linear 20–40 mm long, 0.5–1.0 mm wide, glabrous or sparsely covered with minute scabrous hairs, attenuate at base and apex. Stipule-sheath c. 1 mm long, glabrous, produced into lobe usually deeply divided. Inflorescences terminal, paniculiform cymes; peduncles once or twice dichasially branched with each ultimate branch ending in monochasial cymes. Flowers borne mostly in pairs at nodes,

on \pm equal pedicels; pedicels slender, 5–15 mm long; bracts small subulate, 1–3 mm long. Calyx-tube hemispherical, c. 1 mm diameter, glabrous; lobes broadly triangular, c. 0.5 mm long, glabrous. Corolla mauve or white, glabrous outside; tube 0.5–1.0 mm long; bearded at throat; lobes broadly triangular, 1.0–1.5 mm long. Stamens included; anthers subsessile, globose, c. 0.2 mm long. Ovules numerous in each locule. Style c. 0.2 mm long; stigma narrowly conical, 0.5 mm long. Capsule subglobose 2.0–2.5 mm diameter, laterally compressed, slightly furrowed at dissepiment; calyx lobes erect; beak c. 1 mm long, rounded, protruding above calyx lobes. Seeds numerous depressed obconic, c. 0.5 mm wide, obtriangular in outline; surface brown, reticulate-areolate. **Fig. 5E & F.**

Specimens examined: Western Australia. GARDENER DISTRICT: Bat Island, Jun 1973, *Wilson* 10976 (PERTH); Heywood Island (South Island), Bonaparte Archipelago, May 1972, *Wilson* 10911 (PERTH); Spillway Creek area, outflow of Lake Argyle, Jul 1974, *Carr* 3100 & *Beaglehole* 46859 (PERTH).

Distribution and habitat: *O. kochiae* occurs on the islands in the Bonaparte Archipelago and near Kununurra, Western Australia. (**Map 7**). It has been recorded growing amongst rocks on the beach (*Wilson* 10911).

Conservation status: *O. kochiae* is a poorly known species. A conservation coding of 3K is appropriate.

Etymology: The species is named in honour of Mrs B. Koch of Perth who in the Flora of the Kimberley Region recognized it as a distinct taxon.

Notes: *O. kochiae* has been previously confused with *O. mitrasacmoides* but is easily distinguished by its weakly ascending habit, its obconic seeds, and its smaller flowers and capsules.

14. *Oldenlandia mitrasacmoides* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Hedyotis mitrasacmoides* F. Muell., Fragm. 4: 37 (1863). **Type:** [Northern Territory. VICTORIA RIVER REGION:] Depot Creek, March 1856, *F. Mueller* (lecto (here designated): K; islecto: MEL(MEL 1551047)).

Hedyotis trachymenoides F. Muell., Fragm. 4: 40 (1863); *Oldenlandia trachymenoides* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Anotis trachymenoides* (F. Muell.) Domin, Biblioth. Bot. 89: 616 (1929). **Type:** [Queensland.] Dawson River, *F. Mueller*, (lecto (here designated): K; islecto: MEL(MEL 61488)).

Ascending to erect annual herbs to 90 cm high, unbranched or much branched from the base; branchlets terete or weakly ribbed, moderately hispidulous or glabrous. Leaves sessile, linear, 15–70 mm long, 0.2–2.0 mm wide, glabrous or sparsely hispidulous, attenuate at base, acute to acuminate at apex, recurved at margin. Stipule-sheath c. 1 mm long, produced into triangular lobe sometimes deeply divided: margin entire. Inflorescences lax terminal, paniculiform cymes; peduncles unbranched or irregularly dichasially branched with each ultimate branch ending in monochasial cymes. Flowers paired (rarely 1 or 3) at nodes on \pm equal pedicels; pedicels 0.5–2.5 cm long; bracts leaf-like, up to 10 mm long. Calyx-tube subglobose, 1–2 mm diameter, glabrous; lobes triangular, 0.5–1.0 mm long, smooth or scabridulous on margin, colleters sometimes present between lobes. Corolla white to pale mauve, cylindrical glabrous outside; tube 1–6(9) mm long, bearded at throat; lobes ovate or elliptic, 1–4(6) mm long. Stamens partly or completely exserted from corolla tube; filaments 0.3–0.5 mm long; anthers linear-oblong, 0.5–1.5 mm long. Ovules numerous in each locule. Style (0.2)1.5–7.0 mm long; stigma scarcely bifid or capitate, rarely narrowly conical, usually exserted from corolla tube, rarely included. Capsule subglobose to depressed obovoid or obovoid-globose, 1.5–3.0 mm long, 2.0–4.0 mm wide, glabrous, slightly furrowed at dissepiment; calyx lobes erect; beak broad, 0.5–1.0 mm long rounded, equal to or protruding above calyx lobes. Seeds numerous, scutelliform, oblong to broadly elliptic in outline; surface brown or black, reticulate or reticulate-areolate.

Notes: *Oldenlandia mitrasacmoides* as circumscribed here includes the taxon *Oldenlandia trachymenoides* F. Mueller.

O. mitrasacmoides and *O. trachymenoides* were separated by Mueller (1863) on the basis of the corolla length and capsule shape. From the herbarium material examined it became apparent that these characters vary over the range of the taxa. Populations in

the Burke and Cook Pastoral Districts of Queensland are difficult to place as they are somewhat intermediate between the types.

Three subspecies are recognised.

1. Capsules ovoid-globose, 2.5–3.0 mm long, 2.0–3.0 mm wide. NT, Qld
 Capsules subglobose to depressed obovoid, 1.5–2.5 mm long, 2.0–3.5 mm wide subsp. **nigricans** 2
2. Corolla tube 1.2–3.0 mm long, usually no more than twice the length of the calyx lobes; rim of seeds distinctly incurved; capsule subglobose.
 WA, NT, Qld subsp. **mitrasacmoides**
 Corolla tube 3.0–6.5 mm long, at least 3 times the length of the calyx lobes; rim of seeds only slightly incurved; capsule transversely ovoid.
 Qld subsp. **trachymenoides**

14a. *Oldenlandia mitrasacmoides* (F. Muell.) F. Muell. subsp. *mitrasacmoides*

Erect to ascending herbs to 50 cm tall, mostly very little branched from base; stems terete or slightly ribbed, glabrous or hispidulous. Leaves 30–70 mm long, up to 1 mm wide. Corolla white or pale mauve; tube 1.2–3.0 mm long, usually no more than twice the length of the calyx lobes; lobes ovate-triangular, 1.0–3.0 mm long. Style 1.5–3.0 mm long. Capsule subglobose, 1.5–2.5 mm long, 2.0–3.0 mm wide. Seeds oblong in outline, 0.5–0.7 mm wide; rim thick, incurved; surface dark brown, reticulate-areolate. **Figs 1B & 6D & E.**

Selected specimens: Western Australia. DAMPIER DISTRICT: between Broome and Crab Creek, Mar 1985, *Foulkes* 188 (PERTH). FITZGERALD DISTRICT: 95 km W along the Gibb River road from the Great Northern Highway, c. 72 km SW of Wyndham, Apr 1989, *Halford* H28 (BRI,PERTH). GARDNER DISTRICT: Valentine's Spring, c. 11 km NW of Kununurra, Apr 1989, *Halford* H19 (BRI,PERTH); near Kimberley Research Station, Ord River, Apr 1958, *Burbridge* 5705 (CANB); 8 km SE of Kununurra, Mar 1978, *Paijmans* 2415 (CANB,PERTH); 1.5 km W of Lake Argyle turn-off on Kununurra – Timber Creek road, c. 33 km SE of Kununurra, Apr 1989, *Halford* H17 (BRI,DNA,MEL,PERTH). Northern Territory. DARWIN AND GULF REGION: c. 37 miles [59.5 km] NE of Maranboy Police Station, Mar 1965, *Lazarides & Adams* 30 (CANB,DNA); 17 miles [27 km] E of Pine Creek, *Nelson* 289 (BRI,DNA,MEL,NSW); Blain, 19 miles [30.6 km] S of Katherine, Nov 1961, *McKee* 8436 (CANB,DNA,NSW). VICTORIA RIVER REGION: Jasper Gorge, Apr 1989, *Halford* H63 (BRI,DNA). BARKLY TABLELANDS REGION: 24 km NE of Cape Crawford along road to Borroloola, Apr 1989, *Halford* H94 (BRI,DNA,K,MEL); c. 27 km SW of 'Calvert Hills' on the road to 'Creswell Downs', May 1974, *Pullen* 9253 (BRI,CANB). CENTRAL NORTHERN REGION: Woggles Waterhole, Kurundi Station, Sep 1983, *Latz* 9783 (DNA). Queensland. BURKE DISTRICT: Smith's Range, 118 km NE of Camooweal on Camooweal – Gregory Downs road, May 1989, *Halford* H98 (BRI); c. 15 km SW of Normanton on the road to 'Mogoura' Station, Apr 1974, *Pullen* 8879 (CANB,DNA); 50 km SE of Normanton along Gulf Development road, May 1990 *Halford* Q270 (AD,BRI,NSW). COOK DISTRICT: Davies Creek N.P., 1 km past car park, Jun 1991, *Forster* PIF8468 (BRI,DNA,MEL); c. 10 km W of Georgetown along Gulf Development road, near old smelter site, May 1990, *Halford* Q249 (BRI,DNA,MEL).

Distribution and habitat: *O. mitrasacmoides* subsp. *mitrasacmoides* is widespread in northern Australia, from the Kimberley Region, Western Australia to north eastern Queensland (**Map 9**); grows in a wide range of habitats on sandy, clay or gravelly soils on plains, river levees or rocky hills in open heaths, grasslands, woodlands or open forests.

Typification and Notes: *Hedyotis mitrasacmoides* was described by Mueller from specimens he collected on the Gregory Expedition of Northern Australia. A specimen at MEL (MEL 1551047) has a label in Mueller's hand 'Hedyotis mitrasacmoides, Depot Creek, F. v. Mueller'; this consists of a single plant with mature capsules and seed. At Kew there are three specimens on a single sheet. The two on the left of the sheet have a label in Mueller's hand 'Hedyotis mitrasacmoides, Depot Creek, March 1856, F. v. Mueller'. These two plants have flowers, capsules and seed present. The single specimen on the right of the sheet has a label in Mueller's hand 'Hedyotis mitrasacmoides, F. v. Mueller, not uncommon in tropical Australia but this the only specimen in this collection'. This specimen does not agree with Mueller's protologue description of capsule shape. The material at Kew collected by Mueller from Depot Creek is selected as lectotype because it agrees with the protologue, has flowers, fruits and seeds. The MEL material is regarded as a isoelectotype.

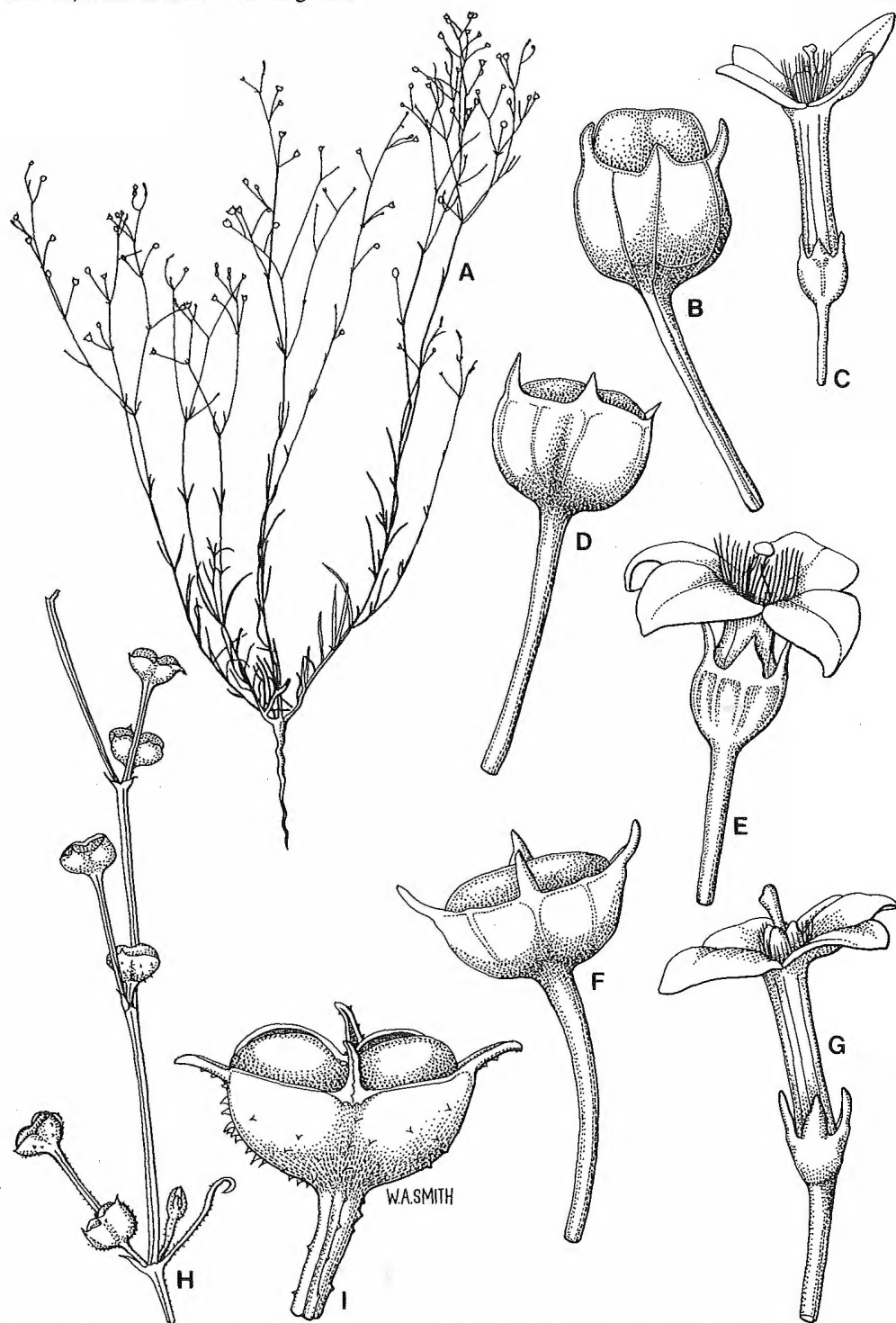


Fig. 6. *Oldenlandia mitrasacmoides* subsp. *nigricans*: A. habit $\times 0.33$. B. side view of capsule $\times 8$. C. flower $\times 8$. *Oldenlandia mitrasacmoides* subsp. *mitrasacmoides*: D. side view of capsule $\times 8$. E. flower $\times 8$. *Oldenlandia mitrasacmoides* subsp. *trachymenoides*: F. side view of capsule $\times 8$. G. flower $\times 8$. *Oldenlandia pterospora*: H. single inflorescence branchlet $\times 2$. I. side view of capsule $\times 8$. A,B, Specht 300; C, Clarkson 6803 & McDonald; D,E, Halford H14; F,G, Halford Q617; H,I, Dunlop 2579.

Generally the stigma is shortly bifid and is exerted from the corolla tube. There are a number of specimens from the Kimberley region (*Broadbent* 658; *Foulkes* 79; *Carter* 365) that have conical stigmas that are included. It is impossible to distinguish between this and the typical *O. mitrasacmoides* without flowers. More collections are needed to ascertain whether or not this is a distinct taxon or a variant of *O. mitrasacmoides*.

14b. *Oldenlandia mitrasacmoides* subsp. *trachymenoides* (F. Muell.) Halford, *comb. et stat. nov.*

Hedyotis trachymenoides F. Muell., *Fragm.* 4: 40 (1863); *Oldenlandia trachymenoides* (F. Muell.) F. Muell., *Syst. cens. Austral. pl.* 74 (1882); *Anotis trachymenoides* (F. Muell.) Domin, *Biblioth. Bot.* 89: 616 (1929). **Type:** [Queensland.] Dawson River, *F. Mueller* (lecto (here designated): K; isolecto: MEL(MEL 61488)).

Ascending herbs, to 40 cm high, stems ribbed, hispidulous near base. Leaves 15–35 mm long, up to 1 mm wide. Corolla white; tube 3–6(9) mm long, mostly 3 times the length of calyx lobes; lobes ovate, 1.5–3.0(6) mm long. Style 3.5–10 mm long. Capsule depressed obovoid, 1.7–2.0 mm long, 3.0–3.5 mm wide. Seeds broadly elliptic in outline, 0.7–0.9 mm wide; rim thin, slightly incurved; surface dark brown, reticulate-foveate. **Figs 1C & 6F & G.**

Selected specimens: Queensland, NORTH KENNEDY DISTRICT: 15 km N of Charters Towers towards The Lynd Junction, May 1989, *Halford* H130 (AD,BRI,NSW); c. 45 km WSW of Charters Towers along Flinders Highway, towards Hughenden, Apr 1989, *Halford* H3 (BRI,DNA,K,MEL,PERTH). MITCHELL DISTRICT: 22 km NW of Longreach along Landsborough Highway, May 1990, *Halford* Q284 (BRI,CANB,K,NSW); 6 km E of Barcardine along road towards Jericho, May 1990, *Halford* Q286 (BRI,K,MEL). SOUTH KENNEDY DISTRICT: 122 km S of Charters Towers along Gregory Development road, Cape River crossing, May 1990, *Halford* H199 (BRI,CANB,MEL); 1 km N of Belyando River crossing on Gregory Development road, c. 43 km W of Mt Coolon, May 1990, *Halford* Q197 (AD,BRI,L,MEL); 3 miles [4.8 km] E of Mt Coolon T/S, *Adams* 1109 (BRI,CANB,NSW). LEICHHARDT DISTRICT: 14.8 km S of Peak Downs Highway along Fitzroy Development road, c. 26 km SW of Nebo, May 1990, *Halford* Q175 (BRI,K,L,MEL). PORT CURTIS DISTRICT: Mt Slopeaway, Marlborough – Sarina road, Mar 1989, *Reeves* 612 (BRI); S end of Curtis Island, Dec 1929, *Mackenzie* [AQ124570] (BRI). BURNETT DISTRICT: 30 km NNE of Gayndah, Dec 1972, *Pedley* 4011 (BRI). DARLING DOWNS DISTRICT: 'Rockwood' c. 20 miles [32.2 km] SW of Chinchilla, Nov 1969, *Pedley* s.n. [AQ124654] (BRI); Marmadua S.F., 45 miles [72.4 km] WSW of Dalby, Feb 1962, *Pedley* 958 (BRI).

Distribution and habitat: *O. mitrasacmoides* subsp. *trachymenoides* is known from near Charters Towers, north-east Queensland extending south to the Darling Downs (**Map 9**). It grows in eucalypt forests, *Acacia* shrublands or cypress woodlands on a range of soil types.

Typification and Notes: In the protologue of *Hedyotis trachymenoides*, Mueller cited two collections; his own collection from the Dawson River and a collection made by Bowman from Issacs River. There is a specimen at Kew collected by Mueller from the Dawson River. It has capsules, flowers and seeds and agrees with the protologue description. There is a small fragment in MEL (MEL 61488) of Mueller's collection from the Dawson River. No specimens of Bowman's were located, although there is a specimen at MEL (MEL 61487), without the collector recorded from the Issacs River. The Kew sheet is chosen as lectotype because it is part of the original material and is a better specimen than the fragment at MEL which is regarded as a isolectotype.

Mueller in the protologue and on specimens he had examined spelt the epithet 'trachymenoides'. In his first and second edition of the Systematic Census of Australian Plants he spelt the epithet 'trachymenioides'. This spelling was later taken up by Bailey (1900). As the original spelling is orthographically correct there is no reason under the International Code of Botanical Nomenclature (1983) to change the spelling and the original spelling should be retained.

14c. *Oldenlandia mitrasacmoides* subsp. *nigricans* Halford, *subsp. nov.* corollae tubo longo *O. mitrasacmoidi* subsp. *trachymenoidi* similis, et seminum margine angusto crasso subsp. *mitrasacmoidi* similis, sed habitu plerumque altiore erecto, capsulo oblongo-globoso et planta in sicco nigrescente facile distinguenda. **Typus: Northern Territory. Hemple Bay, Groote Eylandt, in the Gulf of Carpentaria, 28 April 1948, *R.L. Specht* 300 (holo: BRI; iso: AD,CANB,DNA,MEL,NSW,PERTH).**

Erect herbs to 90 cm high, usually much branched at the base; branchlets terete sometimes slightly ribbed, hispidulous or rarely glabrous. Leaves 10–60 mm long, 1–2 mm wide.

Corolla pale mauve; tube 2.5–6.0 mm long, mostly 3 times the length of calyx lobes; lobes ovate to elliptic, 1.5–4.0 mm long. Style 3.5–7.0 mm long. Capsule ovoid-globose, 2.5–3.0 mm long, 2.0–3.0 mm wide, wide; calyx lobes erect; beak 0.5–1.0 mm long, truncate, \pm equal to or longer than calyx lobes. Seeds oblong in outline, 0.6–0.8 mm wide; rim thick, incurved; surface black, reticulate-foveate. **Fig. 6A–C.**

Selected specimens: Northern Territory. DARWIN AND GULF REGION: Little Lagoon, Groote Eylandt, in the Gulf of Carpentaria, Apr 1948, *Specht* 232 (AD,BRI,CANB,MEL,NSW). Queensland. COOK DISTRICT: Between Pine River Basin and Gulf coast, N. of Duyfken Point, 12°27'S, 141°37'E, Feb 1981, *Morton* AM1117 (BRI); 1 km S of Archer River Roadhouse, 13°26'S, 142°57'E, Apr 1988, *Forster* 4251 & *Liddle* (BISH,BRI,DNA,LAE); 2 km S of the Big Coleman River on the Coen to Musgrave road, 14°35'S, 143°25'E, May 1987, *Clarkson* & *Simon* 7123 (BRI); c. 35 km NW of Cooktown on road to 'Battle Camp', May 1989, *Halford* H121 (BRI,DNA,K,MEL,PERTH); 10 km S of Laura on the Peninsula Development Road, 15°37'S, 144°37'E, Jun 1981, *Clarkson* 3675 (BRI); Bloodwood Lagoon, 16 miles [25.7 km] S of Dunbar (which is about 60 miles [96 km] S.E. of mouth of Mitchell River), 16°03'S, 142°23'E, undated, *Whitehouse* [AQ124573] (BRI); 47.5 km along road to Bulimba Stn, off Chillagoe to Wrotham Park road, 17°00'S, 143°56'E, Jun 1991, *Forster* PIF8411 (BRI,DNA,K,MEL); 24 km S of Einasleigh on the road to The Lynd Junction, May 1990, *Halford* Q248 (BRI,K,L). MITCHELL DISTRICT: Barcaldine, Apr 1919, *White* [AQ124577] (BRI).

Distribution and habitat: *O. mitrasacmoides* subsp. *nigricans* occurs from Cape York Peninsula south to Barcaldine, central Queensland with one record from the north east of the Northern Territory (**Map 1**). It grows mostly in eucalypt woodlands and forests on sandy soils.

Distinguishing features: This subspecies has a long corolla tube similar to subsp. *trachymenoides* and a narrow thick rim to its seed similar to subsp. *mitrasacmoides*, but is easily distinguished by its usually taller erect habit, ovoid-globose capsule and the plant turning black when dry.

Conservation status: This subspecies is not considered to be rare or threatened at present.

Etymology: The specific epithet alludes to the black colour of the plants when dried.

15. *Oldenlandia pterospora* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74 (1882); *Hedyotis pterospora* F. Muell., Fragm. 4: 40 (1863). **Type:** Sturt's Creek, February 1856, *F. Mueller* (holo: MEL(MEL 61485); iso: K).

Ascending to erect ephemeral herbs, to 40 cm high, much branched from base; branchlets ribbed, scabrous, hispidulous. Leaves sessile, linear, 15–45 mm long, 0.7–4.0 mm wide, hispidulous on the upper surface and on the midrib below, acute at apex; margin revolute. Stipule-sheath 0.5–1.5 mm long, truncate or produced into single lobe, entire or with 1–3 fimbriae on margin. Inflorescences terminal, paniculiform cymes; peduncles irregularly dichasially branched with each ultimate branch ending in monochasial cymes. Flowers borne in pairs, on unequal stout pedicels, 1st pedicel 2–5 mm long, 2nd pedicel 5–15 mm long, hispidulous; bracts subulate, 2–4 mm long. Calyx-tube turbinate, 1.0–1.5 mm long, 1.5–2.0 mm wide, hispidulous; lobes triangular, 0.7–1.7 mm long. Corolla white, cylindrical; tube 1.5–3.3 mm long, densely hairy at throat; lobes ovate, 1–3 mm long. Filaments 0.25–0.5 mm long; anthers oblong, 0.5–0.8 mm long, partly exserted from throat. Ovules 2–6 per locule. Style 2.5–4.7 mm long, exserted; stigma bifid. Capsule depressed obovoid, 2–3 mm long, 3–4 mm wide, deeply furrowed along dissepiment, sparsely hispidulous with laterally flattened conical hairs; calyx lobes erect, recurved at apex; beak emarginate, 0.5–0.8 mm long, protruding above calyx lobes. Seeds 4–8 per capsule, menisoid, broadly elliptic in outline, 1.8–2.7 mm long, 1.0–1.5 mm wide; surface light brown, shiny, reticulate-areolate. **Fig. 1D & 6H & I.**

Selected specimens: Western Australia. CANNING DISTRICT: N of Dragon Tree Soak, Great Sandy Desert, Aug 1977, *George* 14775 (PERTH); Great Sandy Desert, 20°21'S, 122°04'E, May 1979, *Mitchell* 1170 (AD,PERTH); Great Sandy Desert, 20°45'S, 123°30'E, Apr 1964, *Beard* 3248 (PERTH); 2 km W of Thomas Peak, 20° 53'S, 128°05'E, Jul 1981, *Cane* 91 (DNA); Edge of Great Sandy Desert, 21°18'S, 121°17'E, Aug 1977, *Barker* 2046 (AD); 16 km NE of Well 42, Canning Stock Route, May 1979, *George* 15570 (PERTH); c. 10 km SW of rockhole, Wilson Cliffs, Great Sandy Desert, 22°11'S, 127°03'E, May 1977, *de Graaf* 40 (PERTH). MUELLER DISTRICT: Wolf Creek Crater, 19°10'S, 127°48'E, Apr 1979, *George* 15332 (PERTH). KEARTLAND DISTRICT: Little Sandy Desert, 22°53'S, 121°59'E, Apr 1979, *Mitchell* 520 (PERTH). Northern Territory. VICTORIA RIVER REGION: Upper Victoria River, undated, *Mueller* s.n. (K). CENTRAL NORTHERN REGION: The Granites Tenements, Tanami Desert, 20°33'S, 130°18'E, Dec 1984, *Kalotas* 1699 (DNA); 20 miles [32.2 km] S The Granites, Aug 1936, *Cleland* s.n. (AD,DNA); 13 miles [20.9 km] NW Numagalong Homestead, Aug 1965, *Nelson* & *Swinbourne* 6 (AD,BRI,DNA,MEL,NSW). CENTRAL SOUTHERN REGION: 18 miles [29 km] W Ehrenberg Range, 23°13'S, 130°06'E, Apr 1972, *Latz* 2313 (AD,DNA,PERTH); Tobermorey Station, Yardida Bore, 23°18'S, 137°51'E, May 1972, *Dunlop* 2579 (BRI,DNA,NSW); Simpson Desert, 15 miles [24.1 km] N Andado Homestead, 25°10'S, 135°12'E,

Aug 1968, *Wiedemann* A.47 (DNA); ditto, *Wiedemann* A.54 (DNA); Simpson Desert, Amerada Petroleum Corporation n° 1 Hale River, Nov 1966, *Symon* 4344 (AD,NSW).

Distribution and habitat: *O. pterospora* occurs in central Australia from the Great Sandy Desert, Western Australia to the Simpson Desert, Northern Territory (**Map 7**). It grows on red sandy soils on sand ridges and sandhills in spinifex grasslands, shrub steppes and open eucalypt woodlands; also recorded in a disturbed site on gravelly soils.

Conservation status: This species is not considered to be rare or threatened at present.

Notes: A very distinctive species with its flowers borne in pairs on unequal stout pedicels, its depressed obovoid capsule with a distinctly emarginate beak and its meniscoid seeds. This species has evident affinities with *O. mitrasacmoides* which has similar floral and seed morphology.

16. Oldenlandia largiflorens (Halford) Halford, **comb. nov.**

Hedyotis largiflorens Halford, *Austrobaileya* 3: 204 (1990) **Type:** Northern Territory. DARWIN AND GULF DISTRICT: Edith Falls, 33 km N of Katherine, 28 April 1989, *D. Halford* H75 (holo: BRI; iso: DNA,K,PERTH).

See Halford (1990) for a description, illustration and notes on distribution.

17. Oldenlandia laceyi (Halford) Halford, **comb. nov.**

Hedyotis laceyi Halford, *Austrobaileya* 3: 208 (1990) **Type:** Queensland. COOK DISTRICT: Mareeba mining lease, Tinaroo Creek road, c. 15 km SE of Mareeba, 9.6 km off Kennedy Highway, 1 km before Douglas Creek crossing, 1 May 1972, *I.B. Staples* 010572/11 (holo: BRI; iso: DNA,K,PERTH).

See Halford (1990) for a description, illustration and notes on distribution.

18. Oldenlandia leptocaulis (Halford) Halford, **comb. nov.**

Hedyotis leptocaulis Halford, *Austrobaileya* 3: 206 (1990) **Type:** Northern Territory. DARWIN AND GULF DISTRICT: 7.5 km S of Cooina on Pine Creek road, 20 May 1980, *M. Lazarides* 8869 (holo: DNA; iso: AD,BRI,CANB,MEL,NSW).

See Halford (1990) for a description, illustration and notes on distribution.

19. Oldenlandia thysanota (Halford) Halford, **comb. nov.**

Hedyotis thysanota Halford, *Austrobaileya* 3: 209 (1990) **Type:** Northern Territory. DARWIN AND GULF DISTRICT: near Koongarra saddle, 1.5 km north of Koongarra, 22 May 1980, *M. Lazarides* 8899 (holo: DNA; iso: AD,BRI,CANB,MEL,NSW).

See Halford (1990) for a description, illustration and notes on distribution.

20. Oldenlandia delicata (Halford) Halford, **comb. nov.**

Hedyotis delicata Halford, *Austrobaileya* 3: 211 (1990) **Type:** Western Australia. GARDNER DISTRICT: 28 km S of Kununurra, east bank of spillway creek next to bridge on road to Ord Dam, 20 April 1989, *D. Halford* H54 (holo: BRI; iso: DNA,K,PERTH).

See Halford (1990) for a description, illustration and notes on distribution.

Unknown and excluded taxa

Oldenlandia mollugoides O. Schwarz, *Repert. spec. nov. regni veg.* 24: 99 (1927). **Type:** 'Port Darwin, sect. 44 (*Bleeser* No. 259)'.
 The type was destroyed in Berlin in 1943 and no duplicates of this Bleeser number have been found. From Schwarz's description of this taxon it appears to be an early record of the pantropical species *Oldenlandia corymbosa*.

Hedyotis psychotrioides F. Muell., *The Victoria Naturalist* 6: 54 (1889) = *Wendlandia psychotrioides* (F. Muell.) F. Muell., *The Victoria Naturalist* 8: 178 (1892).

Oldenlandia paniculata L. Trimen (1894) noted that '*O. paniculata* is quite doubtful; it is entirely based on a figure in Burmans Thes. Zeyl. t. 71 f. 2, which is apparently a *Mollugo* (certainly not an *Oldenlandia*)'.

Synaptantha

Synaptantha J.D. Hook., in Benth. & J.D. Hook. Gen. pl. 2: 61 (1873). **Type:** *Hedyotis tillaeacea* F. Muell. (*S. tillaeacea* (F. Muell.) J.D. Hook.).

Small herbs with perennial or annual rootstock; stems procumbent or weakly ascending. Leaves opposite, sessile or shortly petiolate. Stipules interpetiolar, adnate to leaf bases forming sheath around the node, scarious, truncate or produced into triangular lobe, entire or lacinate on margin. Flowers 4-merous, isostylous or heterostylous, solitary or in groups of 2-5 at nodes. Calyx-tube subglobose; lobes distinct. Corolla marcescent on fruit in some species; tube very short, up to 0.2 mm long; lobes triangular to ovate, valvate. Stamens with filaments attached to base of corolla as well as to ovary; anthers dorsifixed. Ovary 2-locular, 1/2 to 3/4 inferior; ovules 10-50 on fleshy, globose placentas. Placenta peltately attached by a slender stalk to the middle or to the lower half of septum. Style filiform; stigma bifid; lobes globose or linear. Capsules crustaceous with loculicidally dehiscent beak. Seeds numerous, depressed obconic or depressed ovoid, not becoming mucilaginous when moistened; surface reddish brown, reticulate-areolate.

Distribution: A genus of 2 species; both are endemic to Australia, 1 species is widespread in inland regions.

Notes: *Synaptantha* may be distinguished from other genera of the *Hedyotis/Oldenlandia* complex by its scarcely perceptibly connate corolla lobes; by its staminal filaments being firmly attached to the ovary as well as to the corolla; and by its 1/2 to 3/4 inferior ovaries.

Key to the species of *Synaptantha*

1. Flowers solitary or in clusters of 2-5; subtending leaf not reduced to bract; pedicels 1-6 mm long; seeds depressed obconic. WA, NT, Qld, SA, NSW 1. *S. tillaeacea*
- Flowers solitary or paired; subtending leaf usually reduced to bract 3 mm long; pedicels c. 1 mm long; seeds depressed ovoid. WA, NT 2. *S. scleranthoides*
1. *Synaptantha tillaeacea* (F. Muell.) J.D. Hook., Icon. pl. 12: 41-42 t. 1146 (1876); *Hedyotis tillaeacea* F. Muell., Fragm. 4: 39 (1863); *Oldenlandia tillaeacea* (F. Muell.) F. Muell., Syst. cens. Austral. pl. 74: (1882). **Type:** [New South Wales.] Duroodoo [Dooroodoo] between the Darling and Barrier Range, 27 December 1861, Dr Beckler s.n. (lecto (here designated): MEL(MEL 61491)).

Compact procumbent or weakly ascending herbs to 10 cm high; usually much branched; branchlets terete or tetragonous or triquetrous, tuberculate, hispidulous or glabrous. Leaves mostly sessile or rarely shortly petiolate, linear-oblong, narrowly oblanceolate or very narrowly elliptic 3-17 mm long, 0.5-2.0 mm wide, glabrous, hispidulous or with scabrous hairs, attenuate or truncate at base, obtuse, acute or rounded at apex, with margin sometimes recurved. Stipule-sheath glabrous or hispidulous, 0.5-1.0 mm long, truncate or produced into yellow triangular gland, entire or lacerate to lacinate on margin. Flowers solitary or in groups of 2-5 at nodes. Pedicels 1-6 mm long, glabrous or hispidulous. Calyx-tube subglobose, 0.8-1.3 mm diameter; lobes linear to narrowly triangular, 0.5-1.5 mm long, glabrous, hispidulous or with a few scabrous hairs, sometimes with gland at sinus between lobes. Corolla pale yellow to greenish yellow or whitish with pale pink flush towards tips, marcescent; tube c. 0.1 mm; lobes triangular to ovate, 0.5-2.5 mm long, glabrous or hispidulous outside, hairy inside especially towards apex with short clavate hairs. Staminal filaments 0.3-1.4 mm long. Ovary 1/2 to 2/3 inferior; style filiform, 0.1-1.4 mm long; stigma bifid; lobes globose or filiform, finely puberulent with glandular hairs over surface. Capsule subglobose, ovoid or transverse ovoid, 1.2-2.0 mm long, 1.0-2.0 mm wide, glabrous; calyx lobes erect; beak 0.6-1.0 mm long, rounded.

Seeds depressed obconic, laterally compressed, 0.3–0.4 mm wide; surface light brown, reticulate-areolate.

Synaptantha tillaeacea exhibits considerable variability over its range. Two varieties are here recognised.

1. Plant glabrous with smooth or tuberculate stems, never hispidulous; gland present or absent in sinus between calyx lobes var. *tillaeacea*
Plant hispidulous; sinus between calyx lobes without gland var. *hispidula*

1a. *Synaptantha tillaeacea* (F. Muell.) J.D. Hook. var. *tillaeacea*

Hedyotis elatinoides Benth., Fl. Austral. 3: 405 (1866); *Oldenlandia elatinoides* (Benth.) F. Muell., Syst. cens. Austral. pl. 74 (1882). **Type:** [Western Australia.] Swan River, *Drummond* 4th coll. 108 (holo: K, n.v., photo BRI).

Plant glabrous, never hispidulous, with smooth or tuberculate stems; branchlets terete or ribbed. Gland present or absent in sinus between calyx lobes. Corolla lobes 0.5–2.5 mm long.

Selected specimens. **Western Australia.** ASHBURTON DISTRICT: c. 25 km W of Carnegie H.S. on road to Wiluna, Sep 1984, *Wilson* 11995 (PERTH). CARNEGIE DISTRICT: Beru Pool, Yelma Station, Sep 1973, *Chinnock* 751 (AD). COOLGARDIE DISTRICT: Afghan Rock, c. 180 km E of Norseman, Sep 1980, *Newbey* 7434 (PERTH). FORTESCUE DISTRICT: upper waters of the Fortescue River, May 1958, *Burbidge* 6046 (AD,CANB,PERTH). GILES DISTRICT: along domestic drain at Giles, Rawlinson Range, Aug 1962, *Symon* 2512 (AD). **Northern Territory.** CENTRAL NORTHERN REGION: 5.8 miles [9.3 km] N of Georgina Downs, Oct 1957, *Chippendale & Johnson* 3803 (AD,BRI,DNA,MEL,NSW,PERTH); No. 3 Bore, Manners Creek Station, May 1972, *Latz* 2529 (DNA,NSW); Cockroach Waterhole, Manners Creek Station, May 1972, *Latz* 2522 (BRI,DNA,NSW). CENTRAL SOUTHERN REGION: Hull Creek, Aug 1973, *Latz* 4506 (AD,DNA); Andado Station, Apr 1977, *Henshall* 1426 (AD,DNA); Ayers Rock National Park, Aug 1972, *Dunlop* 2973 (DNA,NSW). **Queensland.** NORTH KENNEDY DISTRICT: 97 km N of Charters Towers, May 1989, *Halford* Q129 (BRI,CANB,K,PERTH). DARLING DOWNS DISTRICT: 'Woodlands', 5 miles [8 km] SW of Westmar, Mar 1961, *Pedley* 753 (BRI). **South Australia.** NORTH-WESTERN REGION: 30 km W of Mimili, Everard Ranges, May 1983, *Bates* 2982 (AD); near Mt Carneena, Western Everard Ranges, Sep 1968, *Kraehenbuehl* 3960 (AD). LAKE EYRE REGION: c. 32 km NE of Innamincka, just west of the S.A./Qld border, Aug 1968, *Kuchel* 2546 (AD,MEL). EASTERN REGION: c. 10 km W of Quinyambie Homestead, Jul 1971, *Whibley* 3499 (AD). **New South Wales.** NORTH FAR WESTERN PLAINS: Fowlers Gap near Broken Hill, Oct 1975, *Jacobs* 2115 (AD,NSW). NORTH WESTERN PLAINS: 'Tuudulya' c. 40 km SE of Louth, Mar 1976, *Moore* 7373 (CANB).

Distribution and habitat: This variety occurs widely across arid Australia, in all mainland states except Victoria, between latitudes 19°S and 34°S (**Map 12**). It grows in a range of soils but most often found in sandy or loamy soils; in the east it is associated with sclerophyllous forest and open woodlands; in the rest of its range it is associated with spinifex grasslands and *Acacia* shrublands, frequently near rocky outcrops, waterholes, claypans and on banks of creeks.

Typification and notes: Mueller cited four collections with his description of *Hedyotis tillaeacea*: (1) (MEL 61492) Cooper's Creek, undated, *Dr Murray* s.n. (2) (MEL 61490) This sheet has two labels 'Flooded ground south of Wills Creek' and 'depressed ground' both *Dr Murray*, Howitt expedition (3) (MEL 61493) Mackenzie, undated, *Mueller* (4) (MEL 61491) Duroodoo [Dooroodoo] between the Darling and Barrier Range, 27 Dec 1861, *Dr Beckler* s.n.. All the specimens cited by Mueller appear to have been used in the production of the description. However the first two specimens above have a gland in the sinus between the calyx lobes. Mueller does not mention the presence of this gland in his description. MEL 61491 is here designated as lectotype as it has flowers and fruits and it best fits the original description.

This variety is far from homogenous with at least three forms recognizable. They are not formally recognized here because of the presence of intermediate forms. Field and biosystematic investigations are required to understand the variability of this taxon.

Form 1. Prostrate herbs with annual or perennial rootstock; branchlets ribbed, glabrous or sparsely covered with scabrous hairs. Leaves linear, oblanceolate or elliptic, mostly 6–17 mm long. Stipule-sheath lacinate on margin, gland absent. Sinus between calyx lobes without gland, although small colleters may be present. Corolla lobes 0.5–1.5 mm long. Capsule subglobose to depressed ovoid. This is the most common and widespread form.

Form 2. Compact tufted herbs with a perennial woody rootstock; branchlets ribbed, tuberculate, glabrous. Leaves linear, 5–7 mm long. Large yellow gland in sinus between calyx lobes and on stipule-sheath. Corolla lobes 1.5–2.5 mm long. Capsule subglobose to ovoid. This form is well developed in north east Queensland e.g. *Forster* PIF3645 & *Bolton*, *Halford* H134, *Henderson* H2651. This form intergrades with Form 1 over a wide area in southern Queensland and northern New South Wales.

Form 3. Small prostrate annual herbs; branchlets ribbed or terete, glabrous. Leaves narrow oblanceolate or elliptic, 2–5 mm long. Stipule-sheath entire or lacinate on margin, gland absent. Sinus between calyx lobes without gland. Corolla lobes 0.5–1.0 mm long. Capsule subglobose to ovoid. Plants from central eastern Western Australia and south west Northern Territory are of this form e.g. *George* 5435, *Tolken* 6064 and *Dunlop* 2973.

1b. *Synaptantha tillaeacea* var. *hispidula* Halford, var. nov. planta hispidula; ramuli rotundati; glandula in sinu inter corollae lobos non praesens; corollae lobi 1–1.5 mm longi. **Typus:** Napperby Salt Lake, 22°51'S, 132°33'E, 12 January 1972, *Dunlop* 2355 (holo: BRI; iso: AD,DNA,NSW).

Plant hispidulous. Branchlets terete. Sinus between calyx lobes without gland. Corolla lobes 1.0–1.5 mm long.

Selected specimens: Northern Territory. CENTRAL NORTHERN REGION: between Inningarra Range and Mongrel Downs Homestead, 20°42'S, 129°44'E, Aug 1970, *Parker* 302 (DNA,MEL); 24 miles [38.6 km] SSE of The Granites, 20°45'S, 130°30'E, Jul 1970, *Parker* 244 (DNA,NSW); Lake Bennett, 22°47'S, 131°01'E, Jan 1972, *Latz* 2665 (DNA). CENTRAL SOUTHERN REGION: bed of Hay River, c. 14 km SSE of Mt Winnecke, 23°18'S, 137°01'E, Jul 1982, *Purdie* 2344 (CANB); c. 3 miles [4.8 km] SW [of] Kings Canyon, 24°16'S, 131°39'E, Dec 1968, *Latz* 329 (AD,DNA); NW Simpson Desert, 24°15'S, 136°35'E, Sep 1973, *Latz* 4634 (DNA); c. 3 km SSW of Kulgera, 25°52'S, 133°17'E, Apr 1978, *Barker* 3522 (AD); 20 km S of McDills number one bore, Simpson Desert, 25°54'S, 135°49'E, Sep 1987, *Leach* 1515 (BRI). South Australia. LAKE EYRE REGION: riverbed of Hamilton River at Pedirka, Jul 1968, *Lothian* 4735 (AD); 2 miles (c. 3 km) E of base camp, which is c. 61 km E of Dalhousie Springs, Aug 1963, *Lothian* 1852 (AD); Goyders Lagoon, 26°46'S, 139°31'E, Aug 1975, *Weber* 4486 (AD); Ross's waterhole, Macumba River, Jan 1927, *Cleland* [AD97148232] (AD); Conngie Lakes, Lake Marroocutchanie, 27°10'S, 140°13'E, Feb 1987, *O'Malley* 335 (AD); Margaret Overflow, 2 km W of the Curdimurka Siding, Oct 1978, *Alcock* 6528 (AD); Muloorina, 29°14'S, 137°54'E, Jul 1973, *S.A. Pastoral Board* [AD98010359] (AD). FLINDERS RANGE REGION: Lake Torrens Basin, east Yadlakina Soakage, Aug 1883, *Cleland* [AD97304236] (AD). EASTERN REGION: 30.91 km from Balcanooa homestead at 107°06', 30°36'54"S, 139°36'39"E, Aug 1980, *Williams* 11395 (AD); 17 km E of Frome Downs Homestead, 31°14'S, 139°58'E, Apr 1976, *Williams* 7924 (AD). Queensland. GREGORY SOUTH DISTRICT: QNC Trip, Site 5, stony downs, c. 30 km ENE of 'Rosebirth', 25°44'S, 139°56'E, Aug 1978, *Purdie* 1284 (BRI).

Distribution and habitat: This variety occurs in central Australia from the Tanami Desert, Northern Territory, south-east to south-western Queensland, western New South Wales and to the Flinders Ranges, South Australia (**Map 11**). It grows in sandy or clay soils in association with spinifex grasslands, herblands or shrublands, frequently in interdunal hollows, near claypans, waterholes and near ephemeral creeks.

2. *Synaptantha scleranthoides* (F. Muell.) Pedley ex Halford, **comb. nov.**

Hedyotis scleranthoides F. Muell., *Fragm.* 4: 39 (1863); *Oldenlandia scleranthoides* (F. Muell.) F. Muell., *Syst. cens. Austral. pl.* 74 (1883); *Anotis scleranthoides* (F. Muell.) Domin, *Biblioth. Bot.* 89: 616 (1929). **Type:** [Northern Territory,] Depot Creek, 30 May 1856, *Mueller* (holo: MEL[MEL 61489]).

Prostrate to decumbent annual herbs, regularly dichotomously branched; branchlets terete or ribbed especially when young, glabrous, rarely scabrous on ribs, occasionally red. Leaves sessile, linear to somewhat subterete, 3–15 mm long, up to 1 mm wide, glabrous, mucronate at apex, sessile. Stipule-sheath truncate, c. 0.5 mm long, with 2 or 3 lacinae on margin. Flowers solitary or paired at node, subtending leaf reduced to bract, serrulate on margin; pedicel c. 1 mm long. Calyx-tube subglobose, c. 1 mm diameter, glabrous; lobes narrowly triangular, 1–1.5 mm long, mucronate, collectors sometimes present between lobes. Corolla white, rotate; tube short, 0.1–0.2 mm long; lobes ovate, 1–1.5 mm long, acute to acuminate at apex, with scattered glandular hairs on margin. Stamens exserted; filaments 0.5–0.8 mm long, attached to base of corolla and ovary; anthers oval c. 0.5 mm long. Style 0.5–0.8 mm long; stigma bifid; lobes globular. Capsule globular, 1–1.8 mm diameter, not furrowed along dissepiment; calyx lobes spreading; beak rounded,

0.5–0.7 mm long, not protruding above calyx lobes. Seeds subglobose, 0.3–0.7 mm wide; surface brown, reticulate-areolate.

Selected specimens: Western Australia. GARDNER DISTRICT: Cape Anjo, N coast of W.A., 13°56'S, 126°34'E, Jul 1973, *Wilson* 11307 (PERTH); Mitchell River, 14°50'S, 125°42'E, Feb 1980, *Dunlop* 5277 (BRI,DNA,PERTH); 16 km along Surveyors Fall track, N of Mitchell Plateau Mining Camp, ± 14°40'S, 125°47'E, Apr 1977, *George* 14487 (PERTH); Mitchell Plateau, 14°50'S, 125°50'E, Jun 1976, *Kenneally* 4884 (PERTH); c. 27 km N of Kalumburu Mission, 14°07'S, 126°45'E, May 1983, *Fryxell & Craven* 4108 (BRI,MEL); Byan Martin Homestead, Bonaparte Archipelago, 15°24'S, 124°22'E, Jul 1973, *Wilson* 11507 (PERTH); Augustus Island, Bonaparte Archipelago, 15°25'S, 124°35'E, May 1972, *Wilson* 10724 (PERTH); Blyxa Creek, Prince Regent River Reserve, 15°42'S, 125°20'E, Aug 1974, *George* 12576 (PERTH); 40 miles [64 km] N Drysdale River, May 1971, *Byrnes* 2282 (BRI,DNA,NSW,PERTH); King Edward River, old CRA campsite, 1 km S of track to old Mitchell River Station (abandoned), 15°08'S, 126°09'E, Jun 1988, *Edinger* 587 (BRI,PERTH); 28 km S of Kununurra, E bank of spillway creek next to bridge on road to Ord Dam, 16°01'S, 128°47'E, Apr 1989, *Halford* H15 (BRI); quartzitic sandstone hills S of the Ernest River, 15°23'S, 127°27'E, Mar 1978, *Hartley* 14698 (CANB); 95 km W along Gibb River Road, from Great Northern Highway, 15°50'S, 127°25'E, Apr 1989, *Halford* H29 (BRI). FITZGERALD DISTRICT: Bindoola Creek, 8.5 km WSW of Home Valley Homestead, Mar 1978, *Lazarides* 8622 (BRI,CANB,DNA,NSW,PERTH); Isdell River near Grace Knob, May 1905, *Fitzgerald* 947 (PERTH); Yates Creek, Leopold Range, 17°09'S, 124°58'E, Apr 1988, *Cranfield* 6379 (PERTH); Inglis' Gap, King Leopold Ranges, May 1905, *Fitzgerald* 756 (PERTH). DAMPIER DISTRICT: Bobby Creek, 11 km ENE of Beagle Bay, Dampier Peninsula, 16°58'S, 122°47'E, Apr 1988, *Crater* 237 (PERTH); *Ibid.*, *Carter* 247 (PERTH); Meda-Oobagooma Road, 80 km by road N of Gibb River Road, 70 km NE of Derby, Jun 1976, *Beaglehole* ACB52743 (PERTH).

Distribution and habitat: Mueller's collection of *S. scleranthoides* from Depot Creek in the Victoria River Region is the only record of this species from the Northern Territory. All other collections come from the Kimberley Region, Western Australia, from the Dampier Peninsula east to the Ord River (**Map 12**). It grows mainly on creek banks or in shallow depressions in grasslands, forblands and open eucalypt or *Melaleuca* woodlands on sandy or sandy lateritic soils.

Conservation status: This species is not considered to be rare or threatened at present.

Notes: *S. scleranthoides* closely resembles *S. tillaeacea* in habit, flower and capsule morphology. Although the corolla and stamens are not persistent on the capsule as in *S. tillaeacea*, I believe it is appropriate to place this species in *Synaptantha* as it agrees in all other respects with the generic circumscription.

Hedyotis

Hedyotis L., Sp. pl. 1: 101 (1753), Gen. pl. ed. 5, 44 (1754). **Type:** *Hedyotis fruticosa* L. (lecto, *vide* Bremekamp, C.E.B., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 48(2): 29 (1952); *Hedyotis* L. sensu Benth., Fl. Austral. 3: 403–406 (1866), in part.; *Exallage* Bremekamp, Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 48(2): 140 (1952); **Type:** *Hedyotis auricularia* L. (= *E. auricularia* (L.) Bremekamp).

Woody herbaceous perennials or subshrubs with stems erect or procumbent. Leaves opposite, entire, chartaceous or coriaceous, sessile or petiolate. Stipules interpetiolar, adnate to leaf-bases, coriaceous or chartaceous; margin with 1–several setae. Inflorescences axillary or terminal, subsessile fascicles or pedunculate corymbiform cymes. Flowers small, 4-merous, isostylous (or heterostylous not in Australia). Calyx-tube subglobose; lobes distinct, joined at base into a short free tube. Corolla white; tube short, not exceeding calyx lobes in length; lobes valvate. Stamens exserted; filaments attached to corolla at the sinus between lobes; anthers dorsifixed. Ovary 2-locular, inferior; ovules 5–15 on fleshy hemispherical placentas. Placenta peltately attached centrally to the septum by short stalk. Style exserted, terete; stigma bifid. Fruit hard, splitting septicidally to the base into two indehiscent pyrenes or rarely indehiscent; beak mostly absent. Seeds numerous, small, depressed obconic or angular, not becoming mucilaginous when moistened; surface reticulate-areolate.

Hedyotis occurs predominantly in tropical and subtropical regions of India, south east Asia, Malesia, Australia, Micronesia, Polynesia and North America. In Australia four native species occur in north east Queensland with one extending into the Northern Territory.

Bremekamp (1952) defined *Exallage* to include those species previously placed in *Hedyotis* with clustered axillary flowers and small indehiscent fruits of two pyrenes. I had initially considered this genus worthy of recognition but as pointed out by Fosberg and Sachet (1991) there are a number of Asia species that closely resemble *H. auricularia* except that there fruits are dehiscent, for example *H. novoguineensis*. Other species such as *H. vestita* and *H. radicans* have indehiscent fruits similar to *H. auricularia* but have pedunculate axillary inflorescences. I agree with Fosberg and Sachet (1991) that until such time there is a more critical examination of these closely allied taxa that *Exallage* should not be segregated from *Hedyotis*.

Key to Australia species of *Hedyotis*

1. Fruit splitting into two indehiscent cocci; stems tetragonous, 1–2 mm thick; leaves up to 3.5 cm long **4. *H. novoguineensis***
 Capsule indehiscent; stems rounded, 1.5–3.0 mm thick or if stems obtusely quadrangular, 2–4 mm thick; leaves longer than 4 cm 2
2. Capsule ellipsoid, 3.5–4 mm long, somewhat fleshy; leaves fleshy; capitate colleters present on margin of stipule-sheath; stems obtusely quadrangular **3. *H. philippensis***
 Fruit globose, 1.5–2 mm diameter, not fleshy; leaves chartaceous fleshy; 1–several setae up to 7 mm long on margin of stipule-sheath, stems terete 3
3. Leaf base obtuse to truncate; leaves smooth, shiny above; inflorescences shortly pedunculate; 1–3 glabrous setae on margin of stipule-sheath **2. *H. radicans***
 Leaf base attenuate; leaves scabridulous at least along margin, dull above; inflorescences sessile dense flowered cymes; 3–9 scabrous setae on margin of stipule-sheath **1. *H. auricularia* var. *melanesica***
- 1. *Hedyotis auricularia* L. var. *melanesica* Fosberg, Bull. Torrey Bot. Club 67: 419 (1940).**
Type: Fiji. Kandavu, hills above Namalata and Ngaloa Bays, *A.C. Smith* 157 (holo: NY, *n.v.*; iso: US, *n.v.*).
Hedyotis auricularia sensu Benth., Fl. Austral. 3: 404 (1866), non *Hedyotis auricularia* L.
Hedyotis lapeyrousii Bartling ex DC., Prodr. 4:420 (1830). **Type:** Vanikoro (holo: G-DC *n.v.*, microfiche BRI).
 [*Oldenlandia auricularia* (L.) F. Muell., Syst. cens. Austral. pl. 74 (1882) nom. inval.]

Decumbent or ascending herbaceous perennial to 40 cm high, much branched. Stems terete up to 2.5 mm diameter, glabrous or moderately covered with minute scabrous hairs, rooting at nodes. Leaves narrowly elliptic to lanceolate, 4–12 cm long, 5–24 mm wide, glabrous, hispidulous or with minute scabrous hairs along midrib above and along midrib and lateral veins below, attenuate at base, attenuate at apex; midrib and secondary nerves distinct on lower surface; petiole 4–8 mm long. Stipule-sheath 2–4.5 mm long, hispidulous, with 3–9 unequal setae up to 7 mm long; setae scabridulous. Inflorescences axillary, subsessile fascicles, 5–8-flowered; pedicels 1–1.5 mm long. Calyx-tube subglobose, c. 1 mm diameter, hispidulous; lobes linear to narrowly triangular, 1.5–2.5 mm long, hispidulous outside, recurved at apex, scabridulous on margin, colleters sometimes present between lobes. Corolla white, rarely tinged blue, sparsely hispidulous outside; tube 1.5–2.5 mm long; lobes linear, 1–2 mm long, erect, reflexed at apex, short stiff hairs inside at base. Staminal filaments thick, c. 0.5 mm long, short stiff hairs at base; anthers linear, c. 0.6 mm long. Style 2.0–3.5 mm long, stiff antrorse hairs on upper half; stigma bifid; lobes 0.5–1.0 mm long, spreading. Fruit indehiscent, cartilaginous, globose, 1.5–2 mm diameter, sparsely hispidulous; calyx lobes erect; beak absent. Seeds depressed obconic, angular, 0.4 mm long; surface dark brown, glossy, reticulate-areolate. **Fig. 7 F–H.**

Selected specimens: Indonesia. Irian Jaya: Mt Nerimbau, near Minjambau, Arfak Mountains, May 1962, *Koster* BW13875 (BRI). Papua New Guinea. WEST SEPIK PROVINCE: Near Kilifas Village, Mar 1970, *Foreman & Kumul* NGF48215 (BRI). NEW IRELAND PROVINCE: Lossuk Timber Reserve area, 40 km SE of Kavieng, Nov 1984, *Gideon* LAE57260 (BRI). WESTERN PROVINCE: Near Ingambit Village, Jun 1967, *Henty et al.* NGF33013 (BRI); Lake Daviumbu, Middle Fly River, Sep 1936, *Brass* 7772 (BRI); Daru Island, Apr 1936, *Brass* 6435 (BRI). NEW BRITAIN PROVINCE: Near helicopter pad on lower slopes of Mt Lululua, May 1973, *Stevens & Leelan* LAE58206 (BRI). BOUGAINVILLE PROVINCE: Near Aku village, c. 10 miles [16 km] W of Buin, Sep 1964, *Craven & Schodde* 449 (BRI). Northern Territory. DARWIN AND GULF REGION: Melville Isle; Mindelu Creek, 11°41'S, 13°38'E, Dec 1991, *Fensham* 1160 (DNA). Queensland. COOK DISTRICT: Lockerbie Scrub, 9.2 km past Lockerbie Homestead on Cape York road, 10°45'S, 142°31'E, Feb 1990, *Forster* PIF6338 (BRI,DNA,QRS,MEL,L); Maloney's Springs, 12°27'S, 142°56'E, Jun 1989, *Forster* PIF5306 (BRI), Brown's Creek, Pascoe River, Jul 1948, *Brass* 19607 (BRI,CANB); Chester River campsite, 13°41'S, 143°27'E, Jul 1978, *Clarkson* 2423 (BRI,NSW,QRS); Upper Parrot Creek, Annan River, Sep 1948, *Brass* 20309 (BRI, CANB); 2 km E of Daintree on road to Mossman, 16°16'S, 145°20'E, Sep 1990, *Halford* Q330 (BRI); Bellenden Ker, May 1937, *Flecker* 310 (AD); Ella Bay, 7 km NE of Innisfail, 17°29'S, 146°04'E, Aug 1990, *Halford* Q318 (BRI); Tully, Mar 1935, *Flecker* 379 (QRS). NORTH KENNEDY DISTRICT: Scraggy Point, Hinchinbrook Island, 18°17'S, 146°06'E, Mar 1975, *Thorsborne* 45 (BRI). PORT CURTIS DISTRICT: Byfield, near Keppel Bay, Sep 1931, *White* 8168 (BRI).

Distribution and habitat: *H. auricularia* var. *melanesica* is found throughout Malasia and Melanesia. In Australia this species occurs on Melville Island, Northern Territory and along the eastern Queensland coastline from Bamaga, Cape York Peninsula as far south as Byfield near Rockhampton (**Map 15**). It grows mainly on creek margins in sclerophyll forests and rainforests in areas with good light penetration to the forest floor or in swampy areas in *Melaleuca* woodlands. Soils are variable.

Conservation status: This species is not considered rare or endangered at present.

Notes: Williams (1987) in his book 'Native Plants of Queensland' Volume 3 page 158 has a photograph labeled as *Hedyotis lapeyrousii*. This is a misidentification and the plant pictured is actually *Hedyotis philippensis*.

2. *Hedyotis radicans* (Bartling ex DC.) Miq., Fl. Ind. Bat. 2: 181 (1859); *Metabolos radicans* Bartling ex DC., Prodr. 4: 435 (1830); *Oldenlandia radicans* (Bartling ex DC.) Kuntze, Rev. Gen. 1: 292 (1891); *Exallage radicans* (Bartl. ex DC.) Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 48(2): 142 (1952).
Type: [Philippines.] Luzon, Haenke (holo: PR; iso: G-DC, *n.v.*, microfiche BRI).

Decumbent herbaceous perennial. Stems terete, 1.5–3 mm diameter, glabrous or with soft hairs extending in a single or in two opposite lines down the stem, rooting at nodes. Leaves narrow elliptic to lanceolate, 6.5–15 cm long, 1–3 cm wide, glabrous, obtuse or truncate at base, acuminate at apex, midrib canaliculate above, midrib and secondary nerves distinct on lower surface; petiole 2–7 mm long, glabrous. Stipule-sheath coriaceous, 3–5 mm long, glabrous or pilose, with 1–3 setae, 3–15 mm long, colleters on margin. Inflorescences axillary, pedunculate corymbiform cymes, 5–8-flowered, 1–3 peduncles per node; peduncles 5–10 mm long, hispidulous; pedicels 1–2 mm long; bracts subulate up to 2 mm long. Calyx-tube subglobose, c. 1 mm diameter, glabrous; lobes triangular, 1.0–1.5 mm long, glabrous, reflexed at apex. Corolla white rarely with green tinge, glabrous outside; tube 1–1.5 mm long; lobes linear 1.5–2 mm long, erect, short stiff hairs inside at base, reflexed at apex. Staminal filaments thick, c. 0.5 mm long, stiff hairs at base; anthers linear-oblong c. 0.7 mm long. Style 2–2.5 mm long, stiff antrorse hairs on middle half; stigma bifid; lobes linear, 0.3–0.6 mm long, reflexed. Capsule indehiscent, cartilaginous, globose, 1.5–2.5 mm diameter, glabrous; calyx lobes erect, recurved at apex; beak absent. Seeds obconic, laterally compressed, c. 0.5 mm long; surface dark brown, reticulate-areolate. **Fig. 7A–E.**

Selected specimens: Philippines. Luzon, Nov-Dec 1918, *Ramos & Edano* BS33798 (BRI); Lake Polog, Luzon, Aug 1915, *Ramos* BS23647 (L); Capiz Province, Panay, Oct and Nov 1925, *Edano* BS46025 (BRI); Alabat Island, Dec 1916, *Merrill* 10465 (L); Cabadbaran (Mt Urdaneta), Mindanao, Oct 1912, *Elmer* 14122 (L). Papua New Guinea. WESTERN PROVINCE: Tarara, Wassi Kussa River, Dec 1936, *Brass* 8503 (BRI, L); Strickland River, 1885, *Bauerlen* [AQ461313] (BRI). CENTRAL PROVINCE: Dieni, Ononga Road, May 1933, *Brass* 3974 (BRI). NEW BRITAIN PROVINCE: Mount Penck, Eleonora Bay, 5°32'S, 149°39'E, May 1973, *Croft & Vinas* NGF41358 (BRI,L). Queensland. COOK DISTRICT: Lamond Hill, Iron Range, Jul 1991, *Forster* PIF9012 (BRI,DNA,K,L,MEL,QRS); Lockhart River, 12°48'S, 143°18'E, date unknown, *Tucker* 366 (QRS); Oliver Creek at tributary of Noah Creek, Cape Tribulation, 16°06'S, 145°27'E, Oct 1973, *Webb & Tracey* 10828 (BRI); South Johnstone, Mar 1938, *Langdon* [AQ445772] (BRI); 6 km W of Babinda, 17°20'S, 145°52'E, Sep 1990, *Halford* Q343 (BRI); Wyvuri Holding, 17°20'S, 146°00'E, Apr 1972, *Hyland* 6024 (QRS); Ella Bay, 7 km NE of Innisfail, 17°29'E, 146°04'E, Aug 1990, *Halford* Q320 (BRI); 5.5 km due W of Clump Point, Lacey Creek State Forest Park, 17°51'S, 146°04'E, Sep 1990, *Halford* Q348 (BRI); State Forest 702, south bank of Murray River near mouth, 18°05'S, 146°01'E, Oct 1975, *Thorsborne* 115 (BRI).

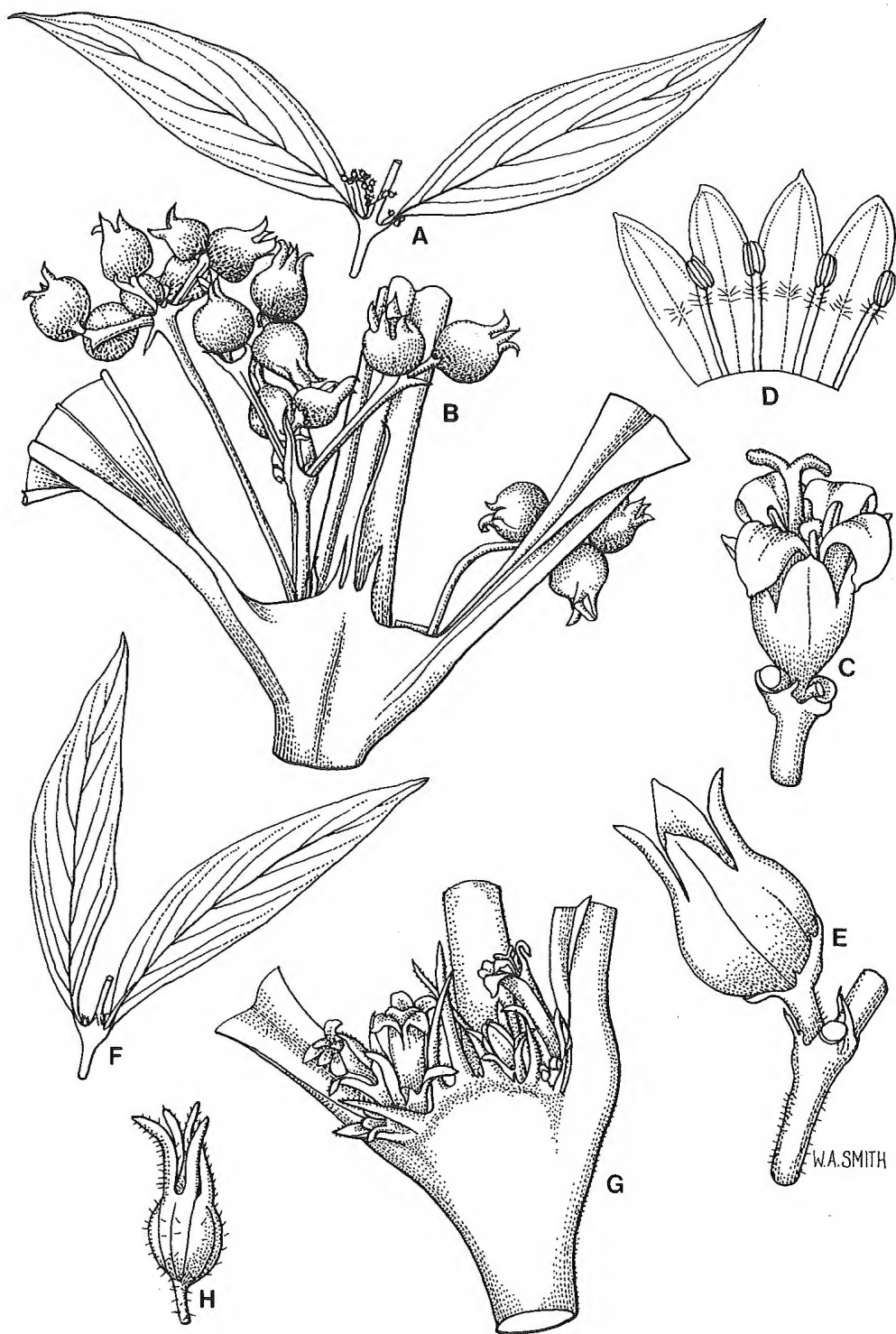


Fig. 7. *Hedyotis radicans*: A. leaves and inflorescence $\times 0.5$. B. inflorescence $\times 4$. C. flower $\times 8$. D. corolla opened out $\times 8$. E. side view of fruit $\times 8$. *Hedyotis auricularia* var. *melanesica*: F. leaves and inflorescence $\times 0.5$. G. inflorescence $\times 4$. H. side view of fruit $\times 8$. A-E, Halford Q320; F,G, Halford Q347; H, Halford Q324.

Distribution and habitat: *H. radicans* occurs in the Philippines and New Guinea. In Australia it is known from along the eastern Queensland coastline from Iron Range to the Murray River near Tully (**Map 14**). It has been recorded in rainforests on the edge of logging tracks, near streams and in areas where strong sunlight reaches the forest floor. Soils are variable.

Conservation status: This species is not considered rare or threatened at the present time.

Notes: The Australian and Papuan New Guinea material that I have seen have leaves much longer than the type material from the Philippines (c. twice as long). The Australian and Papua New Guinea material also differs from the Philippines material in having longer peduncles and being generally less hairy on stems and leaves. *H. radicans* is closely related to *H. auricularia* var. *melanesica* with which it has been previously confused having a similar flower structure and habit. *H. radicans* can be distinguished by its axillary corymbose inflorescences on short peduncles, its obtuse or truncate leaf bases and its glabrous setae on the margin of the stipule-sheath.

I have observed on three occasions parapatric populations of *H. radicans* and *H. auricularia* var. *melanesica*. Examination of these populations reveal no individuals intermediate morphologically and all plants were unequivocally distinguishable as *H. radicans* or *H. auricularia* var. *melanesica*.

3. *Hedyotis philippensis* (Willd. ex Sprengel) Merr. ex C. Robinson, Philipp. J. Sci. 6: 222 (1911); *Spermacoce philippensis* Willd. ex Sprengel, Syst. Veg. 1: 401 (1824); *Exallage philippensis* (Willd. ex Sprengel) Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. II. 48(2): 142 (1952). **Type:** [Philippines.] *Humbolt* (holo: B-Willd 2611, n.v., microfiche BRI).

Hedyotis congesta R. Br. ex G. Don, Gen. Syst. 3: 526 (1834); *Exallage congesta* (R. Br. ex G. Don) Bremek., Verh. Kon. Ned. Akad. Wetensch. Afd. Natuurk., Tweede Sect. II. 48(2): 142 (1952). **Type:** Penang, Aug 1822, *Wallich* Cat. No. 844 (holo: K-W, n.v., microfiche BRI).

Illustration: Williams, Nat. pl. Queensl. 3: 158 (1987), misidentified as *Hedyotis lapeyrousii*.

Erect perennial subshrub to 1 m high, openly branched. Stems stout, 2–4 mm thick, obtusely quadrangular, glabrous. Leaves narrow-lanceolate to ovate-lanceolate or narrow elliptic, 4–11 cm long, 1–3 cm wide, glabrous, somewhat fleshy, shiny above, shortly attenuate to obtuse at base, acute to acuminate at apex; midrib canalicate above, prominent below; petiole 3–10 mm long, glabrous. Stipule-sheath 2–4 mm long, produced into triangular lobe to 7 mm long, villose; margin fimbriate with colleters distinctly capitate. Flowers isostylous (or heterostylous not in Australia). Inflorescences axillary, subsessile fascicles, many-flowered. Calyx-tube globose to obconical, 1.0–2.0 mm diameter, glabrous; lobes elliptic or triangular, 2.5–3.0 mm long, glandular appendage at sinus between lobes. Corolla white, cream or pale mauve; tube cylindrical, 2–3 mm long, glabrous; lobes 2.0–2.5 mm long, erect, reflexed at apex. Staminal filaments c. 1 mm long; anthers oblong, 1.0–1.5 mm long. Style 2.5–3.5 mm long; stigma bifid; lobes linear-oblong, 1.0–1.5 mm long. Fruit ellipsoid, somewhat fleshy, 3.5–4.0 mm long, 2.0–2.5 mm wide, glabrous; calyx lobes erect; beak conical, c. 1 mm long, indehiscent or tardily dehiscent septically into two pyrenes. Seeds depressed obconic, c. 0.5 mm wide; surface dark brown, reticulate-areolate.

Selected specimens: **Thailand.** Province Trang, Kao Chong area, Jun 1974, *Geesink et al.* 7238 (L). **Malaysia.** Malaya Peninsula: Sungai Buloh, Ulu Selangor, Jan 1966, *Hardial & Sidek* 403 (BRI); Alor Bukit, Johore, Nov 1966, *Hardial* 559 (BRI); Sabah. Tawao, Elphinstone Province, Oct 1922 to Mar 1923, *Elmer* 20632 (BRI). **Indonesia.** Sumatera Utara: Sikundar Nature Conservations, Interior of Besting, NW of Tandjunpura, Aug 1971, *Iwatsuki et al.* S299 (L); Kalimantan Timur: around Jelini, along Sungai Belayan, NW of Tabang, Jan 1979, *Murata et al.* B1227 (L). **Philippines.** Luzon Island. Province of Tayabas, Mar 1917, *Edano* BS26953 (L); Panay Island. Libacao, Capiz Province, May-Jun 1919, *Martelino & Edano* BS35384 (BRI); Jaminan, Capiz province, Apr-May 1918, *Ramos & Edano* BS30880 (L). **Papua New Guinea.** WESTERN PROVINCE: Near Ingambit Village, Jun 1967, *Henty et al.* NGF31898 (BRI); Near Rouku, Jul 1974, *Henty* NGF49708 (BRI); Aruhi, Wassi Kussa River, Jul 1968, *Henty & Katik* NGF38662 (BRI). **Queensland.** COOK DISTRICT: c. 45 miles [72.4 km] S of Cape York, Jun 1968, *Pedley* 2733 (BRI); Jardine River, 1 km N of McHenry River junction, 11°17'S, 142°34'E, Oct 1979, *Irvine* 1963 (QRS); Elliot River at the junction of the Elliot River and Mistake Creek, 11°20'S, 142°24'E, Aug 1987, *Clarkson* 7338 (BRI, QRS); Heathlands National Park, Captain Billy Landing Road, 5 km from C.B.

Landing, Sep 1985, *Williams* 85221 (BRI); Tozer Gap, Tozer Range, [12°43'S, 143°11'E], Jul 1948, *Brass* 19517 (BRI,CANB); Iron Range road, 2.6 km past Garraway Creek crossing, Cape Weymouth, Apr 1988, *Forster* PIF4186 & *Liddle* (BRI).

Distribution and habitat: *H. philippensis* is widely distributed in Thailand, Indonesia, Philippines and New Guinea. In Australia this species is found on Cape York Peninsula in an area extending from the Elliot River to Iron Range (**Map 13**). It grows on stream banks in sandy soils in open forests, and seasonally boggy areas in *Melaleuca* swamps, *Casuarina-Melaleuca* scrubs and open forest.

Conservation status: *Hedyotis philippensis* has a limited range in Australia. It is known to occur in the Heathlands National Park. A conservation coding of 3RC+ is appropriate.

Notes: From the overseas material that I have examined this species is very variable in its leaf size over its range.

4. *Hedyotis novoguineensis* Merr. & Perry, *J. Arnold Arbor.* 26: 4 (1945). **Type:** Papua New Guinea. WESTERN PROVINCE: Wuroi, Oriomao River, Jan-Mar 1934, *L.J. Brass* 5831 (iso: BRI).

Ascending to erect or decumbent herbaceous perennial(?) to 50 cm tall. Stems tetragonus, sparsely to densely pubescent, becoming glabrous. Leaves elliptic to obovate, 2–3 cm long, 7–15 mm wide, glabrous above except for sparse pubescence on midrib, sparsely pubescent below, midvein prominent on lower surface, acute or cuneate at base, acute at apex; petiole 1–2 mm long, pubescent. Stipule-sheath c. 1.5 mm long, glabrous or sparsely pubescent, produced into triangular lobe, sometimes deeply bifid. Inflorescences axillary, subsessile fascicles, many-flowered. Flowers not seen. Fruit ovoid-subglobose, c. 2 mm diameter, slightly furrowed along dissepiment, glabrous or sparsely pubescent, indehiscent or eventually splitting septically the full length of capsule into two pyrenes; calyx lobes spreading, ciliate on margin; beak absent. Seeds depressed obconic, c. 0.5 mm wide; surface dark brown, reticulate-areolate.

Specimens examined: Papua New Guinea. WESTERN PROVINCE: Gaima, Lower Fly River (east bank), Nov 1936, *Brass* 8339 (BRI). Queensland. COOK DISTRICT: Foothills – Thornton Peak, Sep 1937, *Brass & White* 263 (BRI); Daintree River, 1890, *T. Pentzke* [MEL 115133] (MEL); Russell River, 1892, *Johnson* [MEL 115202] (MEL).

Distribution and habitat: *H. novoguineensis* is found in the Western Province of Papua New Guinea. The only overseas material I have seen of this species is the isotype and paratype. In Australia this species is recorded from three localities along the eastern coastline of Queensland from near the base of Thornton Peak to Russell River near Babinda (**Map 13**). The only habitat information recorded for the Australian material is that the species grows in grasslands. Habitat notes from Papua New Guinea record the species growing on river banks 'scrambling amongst grass in dense savannah forest'.

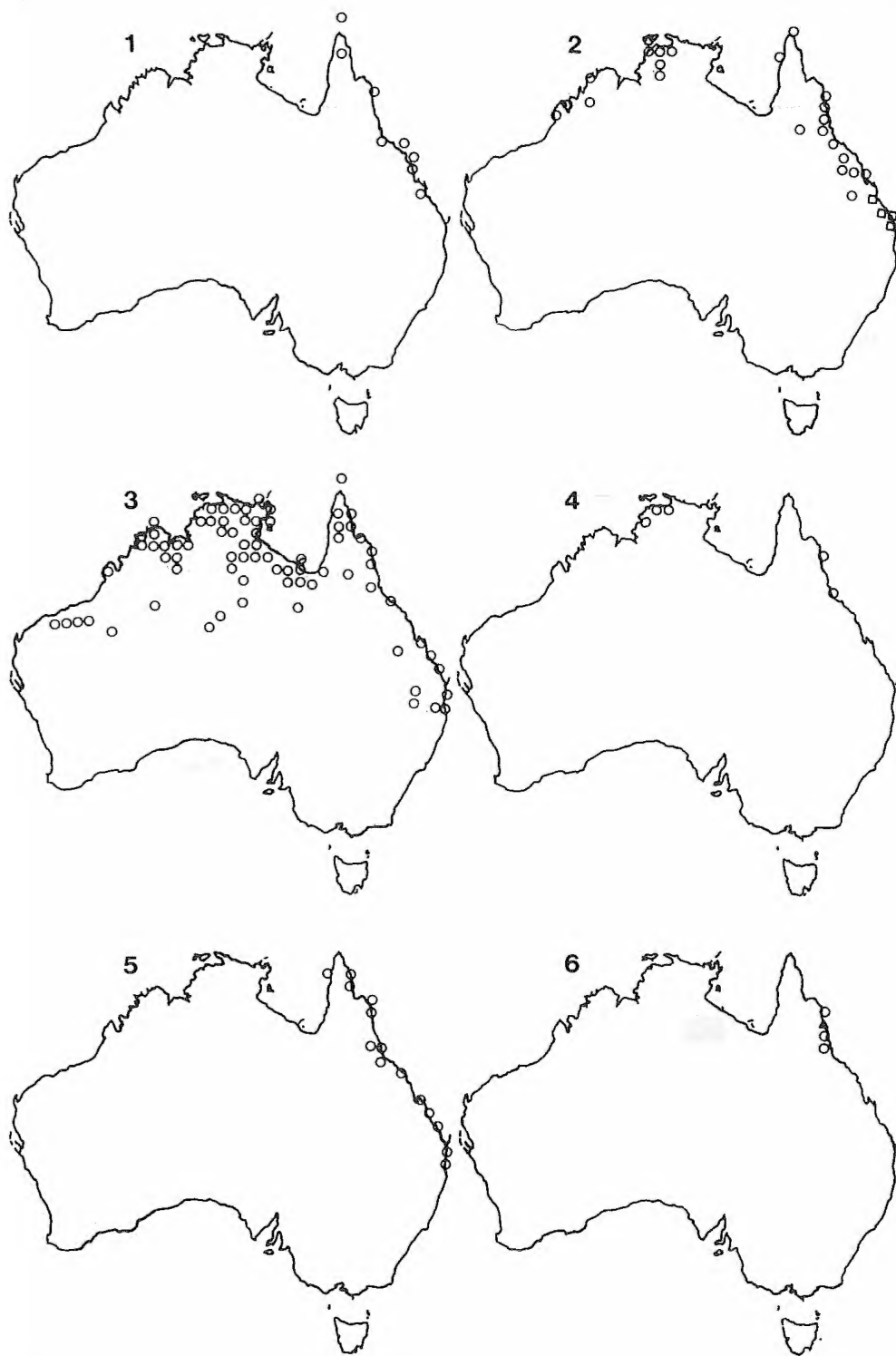
Conservation status: The species has not been collected in Australia since 1937. A broad search of likely localities was undertaken in September 1990 but no new collections were made. A conservation coding of 3K+ is appropriate.

Acknowledgements

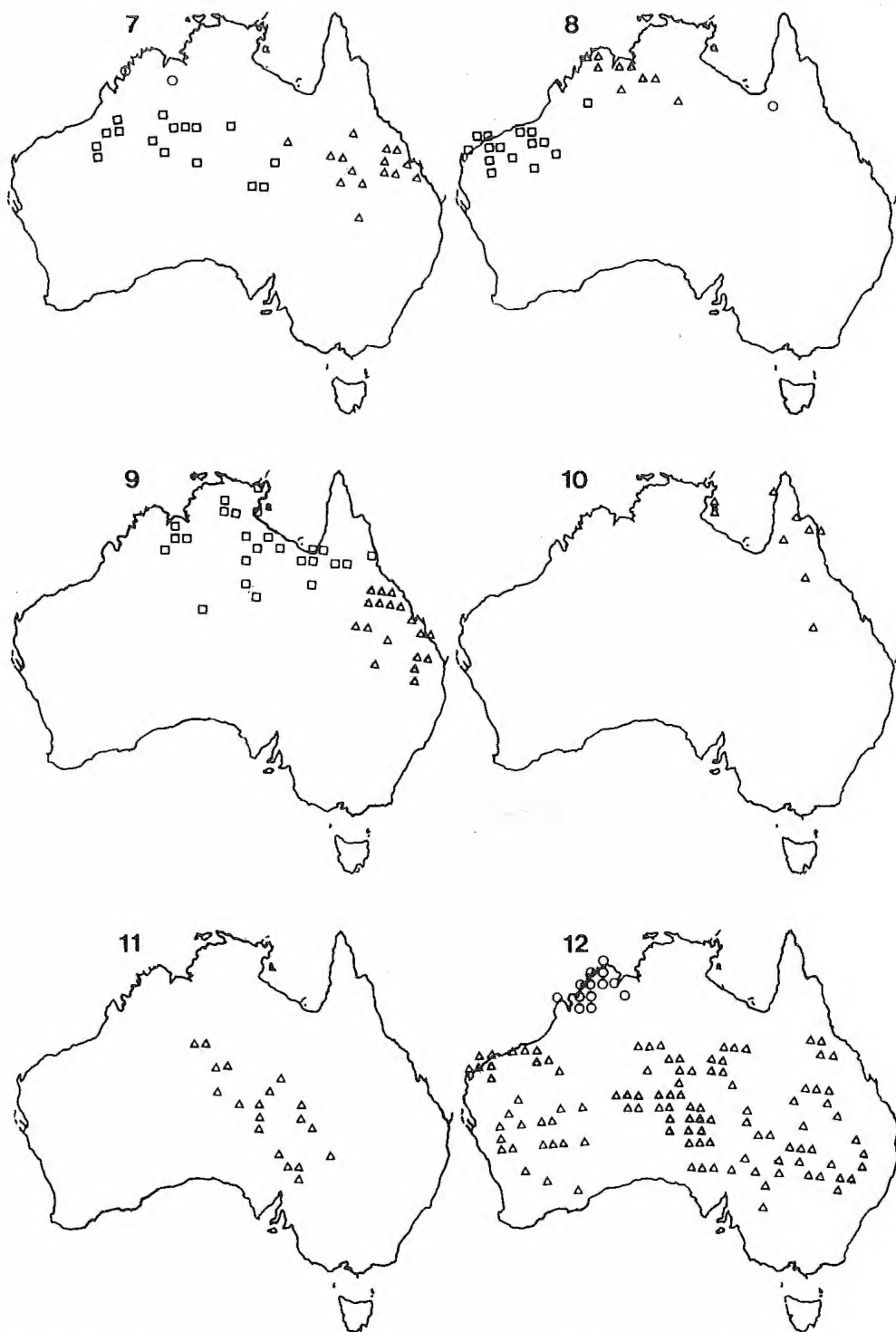
I would like to thank the Directors of AD, BRI, CANB, DNA, G, K, L, MEL, NSW, PERTH and QRS for making material available for study. I would also like to thank Dr T.D. MacFarlane and Dr P.S. Short for their assistance while Australian Botanical Liaison Officers at Kew; Mr L. Pedley for the Latin diagnoses; Mr W. Smith for the illustrations; Mr P. Sharpe for translation of German texts; Mr A. Franks for providing the Scanning Electron Micrographs and Mr R. Henderson, Ms E. Ross and Mr P. Forster for their constructive comments. This work was supported by a grant from the Australian Biological Resources Study (ABRS) in 1990.

References

- BAILEY, F.M. (1900). Rubiaceae. The Queensland Flora. 3: 742–783. Brisbane: H.J. Diddams and Co.
BENTHAM, G. (1866). *Hedyotis*. Flora Australiensis 3: 403–406. London: L. Reeve & Co.



Maps 1–6. Distribution of *Oldenlandia* taxa: 1. *O. biflora*. 2. *O. corymbosa* var. *corymbosa* ○; *O. corymbosa* var. *caespitosa* □. 3. *O. galioides*. 4. *O. tenuifolia*. 5. *O. subulata*. 6. *O. tenelliflora* var. *papuana* △; *O. polyclada* ○.



Maps 7-12. 7-10. Distribution of *Oldenlandia* taxa: 7. *O. pterospora* □; *O. coerulescens* △; *O. kochiae* ○. 8. *O. crouchiana* □; *O. spermacocoides* △; *O. spathulata* ○. 9. *O. mitrasacmoides* subsp. *mitrasacmoides* □; *O. mitrasacmoides* subsp. *trachymenoides* △. 10. *O. mitrasacmoides* subsp. *nigricans*. 11 & 12 Distribution of *Synaptantha* taxa: 11. *S. tillaeacea* var. *hispidula*. 12. *S. tillaeacea* var. *tillaeacea* △; *S. scleranthoides* ○.



Maps 13–15. Distribution of *Hedyotis* taxa: 13. *H. philippensis* ○; *H. novoguineensis* □. 14. *H. radicans*. 15. *H. auricularia* var. *melanesica*.

BREMEKAMP C.E.B. (1939). *Pleiocraterium* genus novum Rubiacearum Hedyotidearum. *Recueil des Travaux Botaniques Neerlandais* 36: 438–445.

BREMEKAMP C.E.B. (1952). The African species of *Oldenlandia* L. sensu Hiern et K. Schumann. *Verhandelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afd. Natuurkunde* 48: 1–297.

BRIGGS, J.D. & LEIGH, J.H., (1988). Rare or Threatened Australian Plants. 1988 revised edition. Australian National Parks and Wildlife Service. Special Publication No. 14. Canberra: Australian National Parks and Wildlife Service.

BULLOCK, A.A. (1958). Nomenclatural notes: VI. *Kew Bulletin* 13: 97–99.

BURMAN, N.L. (1768). *Flora Indica*. Amsterdam/Leiden: J. Schreuder/C. Haak.

CHAMISSE, A. VON & SCHLECHTENDAL, D. VON (1829). De plantis in expeditione speculatoria Romanzoffiana observatis. *Linnaea* 4: 150–165.

DOMIN, K. (1929). Beiträge zur Flora und Pflanzengeographie Australiens. *Bibliotheca Botanica* 89: 616.

FORSTER, J.R. (1786). *Florulae insularum australium prodromus*. Göttingen: J.C. Dieterich.

FOSBERG, F.R. (1943). The Polynesian species of *Hedyotis*. *Bernice P. Bishop Museum Bulletin* 174.

FOSBERG, F.R. & SACHET, M.-H. (1991) Studies in Indo-Pacific Rubiaceae. *Allertonia* 6(3): 191–278.

- HALFORD, D.A. (1990). Six new species of *Hedyotis* L. (Rubiaceae) from Northern Australia. *Austrobaileya* 3: 203-214.
- HALFORD, D.A. (1991a). The genus *Kohautia* Cham. et Schlecht. (Rubiaceae) in Australia. *Austrobaileya* 3: 439-442.
- HALFORD, D.A. (1991b). The genus *Ophiorrhiza* L. (Rubiaceae) in Australia. *Austrobaileya* 3: 369-376.
- HITCHCOCK, A.S. in HITCHCOCK A.S. & GREEN, M.L. (1929). Proposal by A.S. Hitchcock (Washington) & M.L. Green (Kew) pp. 110-199. In International Botanical Congress, Cambridge (England), 1930. Nomenclature. Proposals by British botanists. London: Wyman and Sons.
- HOOKE, J.D. in BENTHAM G. & HOOKE J.D. (1873) *Genera Plantarum* 2: 7-151. London: L. Reeve & Co.
- LEWIS, W.H. (1961). Merger of the North American *Houstonia* and *Oldenlandia* under *Hedyotis*. *Rhodora* 63: 216-233.
- LEWIS, W.H. (1962). Phylogenetic study of *Hedyotis* (Rubiaceae) in North America. *American Journal of Botany* 49: 855-865.
- LEWIS, W.H. (1965). Cytological study of African Hedyotideae (Rubiaceae). *Annals of the Missouri Botanical Garden* 52: 182-211.
- LEWIS, W.H. (1966). The Asian genus *Neanotis* nomen novum (*Anotis*) and allied taxa in the Americas (Rubiaceae). *Annals of the Missouri Botanical Garden* 53: 32-46.
- LINNAEUS, C. (1753, fascimile 1957). *Species plantarum* 1: 101, 102 & 109. London: Ray Society.
- LINNAEUS, C. (1754, fascimile 1939). *Genera plantarum*. Tokyo: Shokunotsu-Bunken-Kankokwa.
- MABBERLEY D.J. (1989). *The plant-book*. Cambridge: Cambridge University Press.
- MAHESWARI DEVI, H. & KRISHNAM RAJU, P.V.S.N.G. (1990). An embryological approach to the taxonomical status of *Hedyotis* L. *Proceedings of the Indian Academy of Science (Plant Science)* 100: 51-60.
- MARCHANT, N., WHEELER, J.R., RYE, B.L., BENNETT, E.M., LANDER, N.S. & MACFARLANE, T.D. (1987). Flora of the Perth region 2: 999-1022. Western Australia: Western Australian Herbarium. Department of Agriculture.
- MARSDEN, C.R. (1981). Rubiaceae. In J. Jessop (ed.), *Flora of Central Australia*. Sydney: A.H. & A.W. Reed Pty Ltd.
- MUELLER, F. (1863). *Fragmenta Phytographiae Australiae* 4: 37-41. Melbourne: Victorian Government.
- MUELLER, F. (1874). *Fragmenta Phytographiae Australiae* 8: 146. Melbourne: Victorian Government.
- MUELLER, F. (1876). *Fragmenta Phytographiae Australiae* 10: 85. Melbourne: Victorian Government.
- MUELLER, F. (1882). *Systematic census of Australian plants*. Melbourne: Victorian Government.
- ROGERS, G.K. (1987). The genera of Cinchonoideae (Rubiaceae) in the south-eastern United States. *Journal of the Arnold Arboretum* 68: 137-183.
- SCHWARZ, O. (1927). *Plantae novae vel minus cognitae Australiae tropicae. Repertorium Specierum Novarum Regni Vegetabilis* 24: 80-109.
- SIVARAJAN, V.V. & BIJU, S.D. (1990). Taxonomic and nomenclatural notes on the *Hedyotis corymbosa-diffusa* complex (Rubiaceae) in India. *Taxon* 39: 665-674.
- SMITH, J.E. (1811). *Hedyotis*. In A. Rees, *The cyclopedia*. Volume 17. London: Longman, Hurst, Rees, Orme and Brown.
- SMITH, A.C. & DARWIN, S.P. (1988). In Smith, A.C. (ed.), *Flora Vitiensis Nova. A new Flora of Fiji*. 4: 352-359. Lawai, Kauai, Hawaii: Pacific Tropical Botanical Garden.
- STANLEY, T.D. & ROSS, E.M. (1986). *Flora of south-eastern Queensland* 2: 320-344. Brisbane: Queensland Department of Primary Industries.
- TERRELL, E.E. (1975). Relationships of *Hedyotis fruticosa* L. to *Houstonia* L. and *Oldenlandia* L. *Phytologia* 31: 418-424.
- TERRELL, E.E. (1990). Synopsis of *Oldenlandia* (Rubiaceae) in the United States. *Phytologia* 68: 125-133.
- TERRELL, E.E. (1991). Overview and annotated checklist of North American species of *Hedyotis*, *Houstonia*, *Oldenlandia* (Rubiaceae), and related genera. *Phytologia* 71(3): 212-243.
- TERRELL, E.E. & LEWIS, W.H. (1990). *Oldenlandiopsis* (Rubiaceae), a new genus from the Caribbean Basin, based on *Oldenlandia callitrichoides* Grisebach. *Brittonia* 42: 185-190.
- TORREY, J. & GRAY, A. (1841). *A flora of North America* 2: 37-43. New York: Wiley & Putman.

- TRIMEN, H. (1894). A hand-book to the flora of Ceylon 2: 314–317. London: Dulau & Co.
- VERDCOURT, B. (1975). Studies in the family Rubiaceae-Rubioideae of the 'Flora of Tropical East Africa. 1.' *Kew Bulletin* 30: 247–326.
- VERDCOURT, B. (1976). Flora of Tropical East Africa. Rubiaceae (Part 1) 268–315. London: Crown Agents.
- WIGHT, R. & ARNOTT, G.A.W. (1834). *Prodromus florae peninsulae Indiae Orientalis* 1: 405–418. London: Parbury, Allen & Co.
- WILLIAMS, K.A.W. (1987). Native plants of Queensland 3: 158. North Ipswich: K.A.W. Williams.
- Accepted for publication 6 March 1992